

DOCUMENT RESUME

ED 353 140

SE 053 097

AUTHOR Moore, William P.
TITLE The Science and Mathematics Magnet Elementary Schools: 1990-1991. Formative Evaluation.
SPONS AGENCY Kansas City School District, Mo.
PUB DATE Aug 91
NOTE 89p.
PUB TYPE Reports - Evaluative/Feasibility (142)

EDRS PRICE MF01/PC04 Plus Postage.
DESCRIPTORS *Academic Achievement; Demonstration Programs; Elementary Education; Enrollment; Formative Evaluation; Institutional Characteristics; *Magnet Schools; Mathematics Achievement; Mathematics Education; *Mathematics Instruction; *Program Evaluation; Racial Differences; Reading Achievement; School Demography; *School Desegregation; School Effectiveness; School Surveys; Science Education; *Science Instruction; Tables (Data); Writing Achievement

IDENTIFIERS Hands On Experience; *Kansas City Public Schools MO; Missouri Mastery and Achievement Test

ABSTRACT

The Kansas City, Missouri, Long Range Magnet School Plan includes the development of math/science elementary schools. These schools emphasize investigative learning through exploration and problem-solving activities. This document is a formative evaluation of the progress in the implementation of the magnet theme during the 1990-1991 school year of four schools in the program: Gladstone Academy, Three Trails, Mary Harmon Weeks, and Phillis Wheatley. Results indicate that three of the four schools had total school enrollments seven to nine percent below capacity. The schools made progress in their efforts to meet the desegregative expectancies of the district. Class size enrollments indicated that each school has maintained the court-mandated pupil-to-teacher ratio. Observational data indicate that deductive learning skills are being promoted in almost half of the observation intervals, and classroom visits indicate that hands-on learning opportunities are frequent in computer, mathematics, and science settings. Teachers indicate progress in the implementation of the magnet theme. Student and parent perceptions of the science/math program appear favorable. Achievement performance in science, mathematics, and reading in grades K-3 are typically above national norms, while achievement in grades 4-5 are generally below the norm. Non-minority students are typically outscoring minority students. Recommendations call for: (1) continued efforts at racial desegregation; (2) increased opportunities for students to visit science and animal rooms; (3) increased engagement in inquiry-oriented learning in computer classes; (4) increased opportunities for problem solving during math/science instruction; (5) examination of concerns for teachers' physical safety at two schools; and (6) re-examination of reading instruction at the schools. Appendices A and C list the schools' field trips, guest speakers, awards, and activities. Appendix B reports data of teacher, student, and parent perceptions. (MDH)

ED353140

**Formative Evaluation
of the
Science and Mathematics
Magnet Elementary Schools**

1990-1991

Evaluation Office

BEST COPY AVAILABLE

**The School District of
Kansas City, Missouri**



August 1991

"PERMISSION TO REPRODUCE THIS
MATERIAL HAS BEEN GRANTED BY

Phyllis Clay

TO THE EDUCATIONAL RESOURCES
INFORMATION CENTER (ERIC)."

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION
CENTER (ERIC)

☒ This document has been reproduced as
received from the person or organization
originating it.

☐ Minor changes have been made to improve
reproduction quality.

• Points of view or opinions stated in this docu-
ment do not necessarily represent official
OERI position or policy.

**Formative Evaluation
of the
Science and Mathematics
Magnet Elementary Schools**

1990-1991

**William P. Moore
Program Evaluator**

August 1991

**Evaluation Office
Desegregation Planning Department
The School District of Kansas City, Missouri**

Table of Contents

	Page
Executive Summary	vi
Introduction	1
Program Description	1
Evaluation Design	2
Methods	3
Results	3
Enrollment Goals	3
Class size	5
Implementation	7
School operation and staffing	7
Indicators of classroom theme implementation	8
Observation Results	9
Cognitive skills and activities	9
Math/science infusion	12
Classroom computers	15
Core infusion	15
Experimentation	15
Opportunities for hands-on learning	15
Instructional grouping	17
Physical evidence of science/math infusion	19
Special science/math-related activities	19

Table of Contents (continued)

	Page
Perceptions	19
School leadership perceptions	22
Teacher perceptions	22
Teacher understanding of magnet plan/theme	24
Level of support received	26
Availability of materials and information	26
Resource teacher assistance	26
Staff development/instructional leadership	26
Safety	27
Overall rating of the magnet school program	27
Student perceptions	27
Parent perceptions	29
Extended Day	29
Achievement	31
ITBS	31
Math achievement	31
Science achievement	38
Reading achievement	38
Language achievement	38
MMAT	41
DRP	41

Table of Contents (continued)

	Page
Summary and Recommendations	42
References	45
Acknowledgements	46
Appendices	47

List of Tables

Table	Page
1 Program Capacity and Enrollment	4
2 Minority and Non-Minority Enrollment	6
3 Mean Class Size	7
4 Observation Results by School	10
5 Number & Percent of Visits in Which Hands-On Use of Math Manipulatives, Science Equipment, Animal Handling, and Computer Use were Observed	16
6 Physical Evidence of Math/Science Infusion by School	20
7 Teacher Perceptions	21
8 Student Perceptions	23
9 Parent Perceptions	25
10 Minority and Non-Minority Extended Day Enrollment	30
11 Iowa Tests of Basic Skills Percentile Ranks	32
12 Missouri Mastery and Achievement Test Scale Scores: Grade 3	41
13 Degrees of Reading Power	42

Table	Page
B-3 Parent Perceptions by School	54
B-4 Additional Parent Perceptions	55
B-5 Reasons Parents Chose Science/Math Elementary Magnets ...	56
B-6 Ways Parents Learned About Science/Math Elementary Magnets	57

List of Figures

Figure	Page
1 Activities Observed by School	13
2 Activities Observed by Instructional Content	14
3 Instructional Grouping by School	18
4 ITBS Math Achievement by School and by Grade	36
5 ITBS Math Achievement by Grade and by Minority Status	37
6 ITBS Science Achievement by School and by Grade	39
7 ITBS Science Achievement by Grade and by Minority Status	40

Executive Summary

The elementary science and mathematics magnet schools have completed their second year of operation as part of the Kansas City, Missouri, School District's *Long-Range Magnet School Plan*. The elementary science/math program is being implemented at Gladstone, Three Trails, Weeks, and Wheatley.

This formative evaluation report documents the progress made by four schools during their second year of implementing the science/math theme. The evaluation was guided by the goals and objectives established at each school and in the *Long-Range Magnet School Plan*. The results of this evaluation indicate that three of the four elementary science/math magnets had a total school enrollment seven to nine percent below program capacity. Furthermore, all grade levels, with the exception of Wheatley kindergarten, had actual student enrollments less than the stated capacity for the grade. The elementary math/science schools are making progress in their efforts to meet the desegregative expectancies of the district. Two schools, Gladstone and Three Trails, are closer to meeting racial composition guidelines. Alternately, Weeks and Wheatley are further from meeting the court-ordered desegregative guidelines. Wheatley has demonstrated considerable progress toward the 60% minority/40% non-minority expectancy by increasing non-minority enrollment by 7% from the first year of implementation. Extended day enrollment indicated that the four schools served almost 900 students. Class size enrollment figures indicated that, across all grade levels, each school has maintained the court-mandated pupil-to-teacher ratio.

Almost 3,000 minutes of observational data suggested that deductive learning (inquiry, and problem-solving) skills are being promoted in almost half of the observation intervals. Similarly, visits to laboratory and classrooms indicate that hands-on learning opportunities are frequent in computer, math, and science settings.

Program participants report favorable perceptions of the magnet program. Teacher responses indicate progress in the implementation of the magnet theme. One area of concern for teachers at Weeks and Wheatley was safety. Less than half the teachers at these schools felt safe in their teaching environment. Alternately, more than 80% of the teachers at Gladstone and Three Trails felt safe.

Student and parents perceptions of the science/math program appear quite favorable. A large majority of students are glad they go to their school and feel good about their school. Parents report favorable perceptions and feel well informed about the program. Parents report

satisfaction with their child's progress in science, math, and other basic skills. Greater than 90% of the parents would recommend their child's school to other parents.

Achievement performance of students at the four schools was found to be quite diverse. Science ITBS achievement is above or near the national norm in each of five grade levels tested. Math, reading, and language arts ITBS scores demonstrated a similar pattern across grade levels. Typically, kindergarten, first, second, and third graders perform above the national norm. Fourth and fifth graders are generally performing below the norm.

FORMATIVE EVALUATION OF THE SCIENCE AND MATHEMATICS MAGNET ELEMENTARY SCHOOLS

1990 - 1991

Introduction

The elementary science and mathematics magnet schools examined in this report have completed their second year of implementing the magnet theme as part of the district's *Long-Range Magnet School Plan* (Hale & Levine, 1986), (hereinafter cited as the *Long-Range Plan*). The elementary magnet schools are comprised of four schools: Gladstone Academy, Three Trails, Mary Harmon Weeks, and Phillis Wheatley. Each school serves students in kindergarten through fifth grade. Gladstone has a dual theme as a visual and performing arts magnet and a science/math magnet school.

Given the formative nature of this evaluation, the focus has been upon the implementation of the magnet theme, a description of enrollment and racial composition progress, perceptions of program participants, and achievement data for each of the science/math elementary magnet schools at the end of the second year of implementation.

This report provides a brief discussion of the science/math elementary magnet school program, the design of the evaluation study, and a presentation of the evaluation results. Conclusions and recommendations based upon the obtained results are offered.

Program Description

In 1990-91, the elementary schools were operating at their permanent sites. Gladstone moved into a new facility at the start of the current year. The other three schools have had renovation efforts completed during the year. Laboratory space has been created for math/computer labs, science labs, and animal studies.

According to the Long-Range Plan, the science/math elementary schools may emphasize investigative learning through exploration and problem-solving activities or applied learning, through systematic application of basis skills or "they may introduce other approaches such as the Starwalk and Zoo Opportunities Outreach Projects which have been endorsed by the

National Diffusion Network" (Hale & Levine, 1986, p. 82). This general guideline provided each of the four schools with latitude in the development of a specific curricular and instructional emphasis. Again, according to the Long-Range Plan, "The instructional program at the new science/math elementary magnets will be determined as part of the planning process for these schools . . . [those] involved in this planning may decide to replicate or modify the investigative learning or applied learning themes . . . or they may decide to emphasize alternate science/math approaches" (Hale & Levine, 1986, p. 82). Special provisions have been made to provide greater exposure to animal life at Weeks, Wheatley, and Three Trails. Animal labs, within-class care for animals, and curricular/extra-curricular activities provide students with a greater understanding of how animals and man interact. Gladstone provides a greater emphasis upon the physical sciences.

According to the planning outlines of the four schools, laboratory experiences are designed to provide enrichment opportunities and support the instructional focus in classrooms. Full-time resource teachers provide each classroom with weekly scheduled instruction in the labs. Additionally, all laboratory experiences are expected to be expanded on during regular classroom instruction. Resource teachers jointly plan with the teacher for follow-up classroom activities. Resource teachers in math and science teach the scientific method, laboratory skills, observation skills, prediction and classification, estimation, description, enforcing and measuring skills.

Evaluation Design

Information provided in this formative evaluation addresses program implementation progress, enrollment and racial composition, perceptions of program participants, and levels of student achievement for the second year of implementation. This evaluation was undertaken in an effort to address the following questions:

1. Have the schools met the established enrollment goals?
2. Was the program implemented as detailed in the *Long-Range Magnet School Plan* (Hale & Levine, 1986) and in the planning outlines of the schools?
3. What are parent, teacher, student, and school leadership perceptions about and attitudes toward the program?
4. What are the levels of student achievement in the schools?

Methods

This evaluation has been facilitated through the collection of classroom and laboratory observation data, perception data gathered through interviews and survey instruments, and data obtained through the district's Research Office and Testing Office. Enrollment and racial composition data have been extracted from the official student membership reports prepared by the Research Office of the school district. Minority and non-minority figures are presented by grade for each school. In this report demographic data for Gladstone is reported only for science/math theme students.

The functioning of particular aspects of the magnet school program are evaluated as called for in the Long-Range Plan and the planning outlines of each school. Data regarding implementation have been gathered in classroom observations, laboratory visitations, review of laboratory schedules, on-site examinations of buildings, and interviews. Twice during the 1990-91 year (September, April) interviews with school leadership were conducted to document various aspects of the program and to discuss emerging issues suggested by other sources of information. Parents, students and teachers were contacted during the academic year to gather their perceptions of program functioning and to gain insight into issues of importance. Student achievement indicators are reported. Iowa Tests of Basic Skills (ITBS) percentile ranks are reported by school, grade level, and minority/non-minority designation. Missouri Mastery and Achievement Tests (MMAT) are presented as are Degrees of Reading Power (DRP) scores for fifth grade students.

Results

Enrollment Goals

According to the *September 26, 1990, Student Membership* (1990) report, prepared by the district's Research Office, and program capacity figures utilized by the district's Admissions Office to place students in magnet programs, the math/science elementary schools are enrolling less than the schools and grades could reasonably expect to enroll (see Table 1). Gladstone, Three Trails, and Weeks each had grade level and total school enrollments below program capacity. While the difference between actual and capacity enrollment is not substantially large, these schools, in total, had 85 student vacancies, if one considers program capacity as full enrollment. Only Wheatley had an actual student enrollment in excess of program capacity and this was due to a kindergarten enrollment of twice the program capacity. It is unclear why

Table 1
Science/Math Elementary Magnet Program
Program Capacity and Enrollment
1990-1991

School Grade	Program ¹ Capacity	Actual ²	Difference	% of Capacity
Gladstone				
K	44	40	-4	91%
1	44	41	-3	93%
2	44	40	-4	91%
3	44	38	-6	86%
4	54	52	-2	96%
5	54	47	-7	87%
Total	284	258	-26	91%
Three Trails				
K	44	44	0	100%
1	44	40	-4	91%
2	44	41	-3	93%
3	44	42	-2	95%
4	54	43	-11	80%
5	54	54	0	100%
Total	284	264	-20	93%
Weeks				
K	22	14	-8	64%
1	66	64	-2	97%
2	132	125	-7	95%
3	110	101	-9	92%
4	135	121	-14	90%
5	108	101	-7	94%
Total	573	526	-47	92%
Wheatley				
K	22	44	+ 22	200%
1	44	44	0	100%
2	110	104	-6	95%
3	44	43	-1	98%
4	54	51	-3	94%
5	81	77	-4	95%
Total	355	363	+ 8	102%

44 kindergartners were enrolled when the stated program capacity was 22 students. However, school leadership at Wheatley has indicated that 44 students has been the typical enrollment for their school during the last two years.

The achievement of court-ordered desegregation in the Kansas City, Missouri School District is a central feature of the magnet school plan. According to the Long-Range Plan, "The purpose of magnet schools for KCMSD is to increase desegregation and potential desegregation in as many of its classrooms as possible" (Hale & Levine, 1986, p. 3). All schools are expected to reach and maintain a 60%/40% minority/non-minority ratio at each grade level. In the event that an existing school, converted to a magnet school, begins program implementation with a grade level ratio in excess of the desegregation goal, schools may remain in compliance by making a 2% enrollment modification in the desired direction to reach the 60%/40% goal.

The reader is referred to the total enrollment figures for September, 1990, in which two of the four elementary schools (Gladstone, Three Trails) approximate the desegregation goal (see Table 2). Weeks and Wheatley are far from meeting racial composition goals. While both schools enrolled greater than 80% minority, Wheatley's total non-minority enrollment increased by 7% since the first year of implementation. Each grade level at Gladstone either approaches or meets the racial composition expectancy. Three Trails enrolled predominately non-minority students in the previous year. As such, where grades exceed the 60-40 racial composition in favor of non-minority students, the school is expected to make enrollment modifications to move toward the 60-40 ratio in favor of minority students at that grade level. Three Trails non-minority enrollment has declined by at least 7% since the first year of implementation. Only in grade three are minority enrollments significantly below expectations. Weeks and Wheatley have also made progress toward the goal. In 1990-91, each school had two grades with improved non-minority enrollments. Weeks reduced minority enrollment at a rate greater than 2% in grades two, three, and five. Only at kindergarten, and grades one and four have changes not resulted in a 2% reduction. Wheatley has increased non-minority enrollment at kindergarten and grades one, two, four, and five.

Class size. The Long Range Plan (1986) has specified class size limitations for district classrooms. Accordingly, class size limits for kindergarten through grade three have been established at 22 students. Grades four and five have a limit of 27 students. Based upon figures obtained from the *September, 1989 School Organization* computer printouts prepared by the

Table 2
Minority and Non-Minority Enrollment
Science/Math Elementary Magnet Program
September, 1989, 1990

School Grade	September 1989				September 1990			
	Minority		Non-Minority		Minority		Non-Minority	
	N	% of Total	N	% of Total	N	% of Total	N	% of Total
Gladstone								
Kindergarten	14	50%	14	50%	22	55%	18	45%
1	25	60%	17	40%	23	56%	18	44%
2	14	67%	7	33%	25	63%	15	38%
3	13	57%	10	43%	22	58%	16	42%
4	17	59%	12	41%	29	56%	23	44%
5	14	56%	11	44%	25	53%	22	47%
Total	97	58%	71	42%	146	57%	112	43%
Three Trails								
Kindergarten	25	60%	17	40%	25	57%	19	43%
1	6	15%	34	85%	26	65%	14	35%
2	9	21%	34	79%	15	37%	26	63%
3	25	63%	15	37%	15	36%	27	64%
4	19	40%	28	60%	27	63%	16	37%
5	30	60%	20	40%	30	56%	24	44%
Total	114	44%	148	56%	138	52%	126	48%
Weeks								
Kindergarten	15	79%	4	21%	11	79%	3	21%
1	119	94%	7	6%	60	94%	4	6%
2	98	96%	4	4%	118	94%	7	6%
3	131	99%	2	1%	94	93%	7	7%
4	97	90%	11	10%	112	93%	9	7%
5	84	100%	0	0%	95	94%	6	6%
Total	544	95%	28	5%	490	93%	36	7%
Wheatley								
Kindergarten	21	66%	11	34%	27	61%	17	39%
1	92	98%	2	2%	31	70%	13	30%
2	44	96%	2	4%	91	88%	13	13%
3	36	90%	4	10%	42	98%	1	2%
4	72	94%	5	6%	44	86%	7	14%
5	40	95%	2	5%	63	82%	14	18%
Total	305	92%	26	8%	298	82%	65	18%

district's Research Office, each school, with the exception of Wheatley Kindergarten, had a mean class size, within rounding limits, in compliance with class size limits (see Table 3).

Implementation

The following section presents information relative to the current functioning of selected aspects of the science/math magnet program at the elementary schools. The reader is cautioned to avoid making summative judgments about the success of particular schools at this point in the evaluation process.

School operation and staffing. The full implementation of the science/math theme at the four elementary magnet schools had been impeded by ongoing construction and renovation efforts during the first year. However, in the second year all construction and renovation was completed in time for school start-up. Gladstone's new building was available for occupation during the summer and students were able to move into the new facility at school start-up. Three Trails school leadership reported that all renovation efforts were complete, with the exception of external animal housing facilities. This situation arose when the construction contractor quit prior to completion of these facilities. At the end of the year, the funding was available and bids were being solicited for completion of the animal facilities. Weeks and Wheatley school leadership have indicated that all construction and renovation was complete at their buildings, with only minor touch-up activities occurring.

Table 3
Mean Class Size
Science/Math Elementary Magnet Program
1990-1991

Grade	Gladstone	Three Trails	Weeks	Wheatley
K	22.0	22.0	23.0	22.0
1	20.5	21.0	21.3	22.0
2	22.5	22.5	20.0	20.6
3	21.5	21.5	20.6	22.0
4	27.0	21.3	22.3	26.0
5	26.5	23.6	24.5	24.3

Note: From September 16, 1990 school organization computer printout. Court-ordered maximum class size is 22 students per classroom for grades K through 3. Court-ordered maximum class size is 27 students per classroom for grades 4 and 5.

At the beginning of the 1990-91 implementation year, school leadership at the schools were asked if all magnet-related positions had been staffed. Each of the schools had all positions staffed. When asked again in April, 1990 if there were additional staffing needs that were unforeseen during the planning process, Gladstone and Weeks leadership had suggestions. Gladstone leadership believes a counselor position would be valuable: "Along with developing students in related themes (science and math) they need emotional support, a neutral party who can deal with specialized problems" Weeks leadership believes that students could be better served in laboratory instruction if one resource teacher worked with the primary grades and a second resource teacher worked with the upper grades.

At the end of the 1990-1991 implementation effort, school leadership were asked if they had encountered any problems regarding the acquisition of supplies, materials and equipment. Overall, leadership indicated that a) the necessary materials had been received and distributed.

When asked in September, 1990 whether transportation was problematic with regard to the effective implementation of the magnet program, leadership at each school indicated that minor problems were encountered. According to Gladstone leadership, the new location of the school had created some difficulties for the bus company. However, these problems were resolved quickly. Three Trails leadership indicated, in September, that only minor problems arose and transportation was "100% better than last year." At the end of the year, leadership at Three Trails indicated that transportation was not problematic.

Weeks leadership reported that some buses ran about 15 minutes late to and from school. Leadership reported that problems were associated with extended day transportation. Additionally, cabs "are still running late, and some parents are complaining, especially about yellow cab." Wheatley school leadership has reported that transportation has not been overly problematic. "Our only transportation problems have been with the cabs; they are slow getting here in the afternoon and late in the morning."

Indicators of classroom theme implementation. The focus upon science and math in the four elementary magnet schools suggests a deductive, problem solving learning environment for students. This is reflected in the planning outline for each school. In general, among the planning outlines, there is an emphasis upon inquiry, critical thinking, problem-solving, and investigative hands-on learning. Additionally, given the influence of the magnet theme, each plan speaks to the importance of infusing mathematics and science throughout the entire

curriculum, of integrating laboratory experiences with classroom instruction, of computer-assisted instruction to inspire and motivate, and of providing students with multiple sources of information. The planning outlines for each school propose to provide opportunities for field trips, special projects, and guest speakers which introduce and reinforce instructional topics.

In an effort to further assess program functioning, observations were conducted in a random sample of classrooms in each of the elementary math/science schools. Classroom observations were conducted in three different classroom settings:

- (1) during math or science class time,
- (2) during all other instructional time,
- (3) in support classes (art, physical education, etc.).

During the period spanning October to April, classroom observations were conducted on a bi-weekly basis to determine the presence of: (a) infusion of science and math into other curricular areas, (b) problem solving and critical thinking learning activities, (c) providing students with an opportunity for inquiry, questioning, and exploring new problems; (d) students conducting or participating in experiments, (e) students utilizing classroom computers, and (f) how teachers grouped students for instruction. Two thousand nine hundred forty minutes of classroom observation intervals were completed for this evaluation.

Bi-weekly observations were completed in each school's laboratories (math, science, computer, math-computer, animal room). Lab observations were conducted to document the degree of (a) hands-on learning in math and science labs (e.g., utilization of math manipulatives, science equipment, etc.), (b) utilization of computers in computer labs, (c) and student interaction with animals were available. Fifty-one visits were made in the various lab settings.

Observation Results

Based upon the observational data collected in classrooms and laboratories and on-site visitations to each school, the following findings are presented.

Cognitive skills and activities. Table 4 presents the results of classroom observations, across schools, conducted during the current year. The results reflect the fact that more than one activity could occur during an observation interval. As such, the percentages reported cannot be summed to 100% since two behaviors could be occurring in the same observational

Table 4
Observation Results by School, 1990-1991
Percent of Observation Intervals with Evidence
Science/Math Elementary Magnet Program

Areas Observed	Combined (N= 2940)	Gladstone (N= 700)	Three Trails (N= 660)	Weeks (N= 820)	Wheatley (N= 760)
Cognitive Skills and Activities					
Inquiry	30%	29%	40%	31%	23%
Problem Solving/Critical Thinking ¹	11%	13%	8%	15%	9%
Combined Inquiry, Problem Solving/ Critical Thinking	8%	8%	6%	7%	9%
Other Academic (includes below) ¹	93%	95%	90%	86%	86%
Listening to Presentation	36%	43%	39%	36%	29%
Silent Reading	3%	4%	3%	3%	3%
Silent Worksheets	15%	6%	19%	14%	8%
Hands-On Learning	22%	32%	10%	16%	24%
Classroom Management (includes below) ²	18%	18%	17%	18%	17%
Behavior Disruption	5%	6%	4%	5%	3%
Roll/Attendance	< 1%	< 1%	< 1%	0%	< 1%
Materials	3%	4%	4%	3%	3%
Organizational Activities	10%	7%	9%	10%	11%
Classroom Management While Students Working on Academics	< 1%	< 1%	1%	< 1%	< 1%
Interruption	< 2%	2%	< 1%	2%	< 1%
Other	1%	0%	0%	0%	< 1%
Math/Science Infusion					
Occurring	59%	64%	64%	56%	52%
Not Occurring	41%	36%	36%	44%	48%
Classroom Computers³					
In Use	18%	48%	7%	13%	4%
Not in Use	82%	52%	93%	77%	96%

Table 4 (continued)
Observation Results by School, 1990-1991
Percent of Observation Intervals with Evidence
Science/Math Elementary Magnet Program

Areas Observed	Combined (N= 2940)	Gladstone (N= 700)	Three Trails (N= 660)	Weeks (N= 820)	Wheatley (N= 760)
Core Infusion⁴					
Occurring	50%	71%	43%	39%	52%
Not Occurring	50%	29%	57%	61%	48%
Experimentation (Tchr. Modeling or Student Participation)					
Evident	31%	31%	55%	18%	21%
Not Evident	69%	69%	45%	82%	79%

Note: Percentages are rounded to the nearest whole percent.

- 1 Other academic activities percentage reported reflects the sum of percents for Presentation, Silent Reading, Silent Worksheets, Hands-On Learning, and other academic pursuits.
- 2 Classroom Management reported percentages reflect the sum of percents for Behavior Disruption, Roll/attendance, Materials (distributing, collecting), and Organizational Activities.
- 3 Percentages are based upon classrooms with computers; Total observation intervals (N= 2046), Gladstone (N= 480); Three Trails (N= 400); Weeks (N= 662); Wheatley (N= 504).
- 4 Based on 680 observation intervals completed for math/science subject area.

minute. This observational system reflects the multidimensional nature of classroom instruction and activity.

Accordingly, the reader is directed to the column heading 'combined' (see Table 4) in which results are aggregated across schools. For all classrooms observed, inquiry (30%), problem solving/critical thinking (11%), and combined inquiry/problem solving (8%) occurred in approximately 49% of the observation intervals. Other academic activities (e.g., listening to a presentation, silent reading, working silently on worksheets, hands-on learning, and others not specifically noted) were concurrently occurring during 93% of the observation intervals. As such, the reader will note that almost half of the observation intervals had students engaged in target behaviors (i.e., inquiry, problem-solving/critical thinking) and during many of these activities students were engaged in other academic pursuits at the same time (93%).

Figure 1 presents observation information regarding the occurrence of inquiry, problem-solving activities, combined inquiry and problem solving/critical thinking, and math/science infusion. When these activities were examined by school, the most significant finding was the similarity of engagement rates. Each school was providing their students with learning opportunities in math and science at a comparable rate.

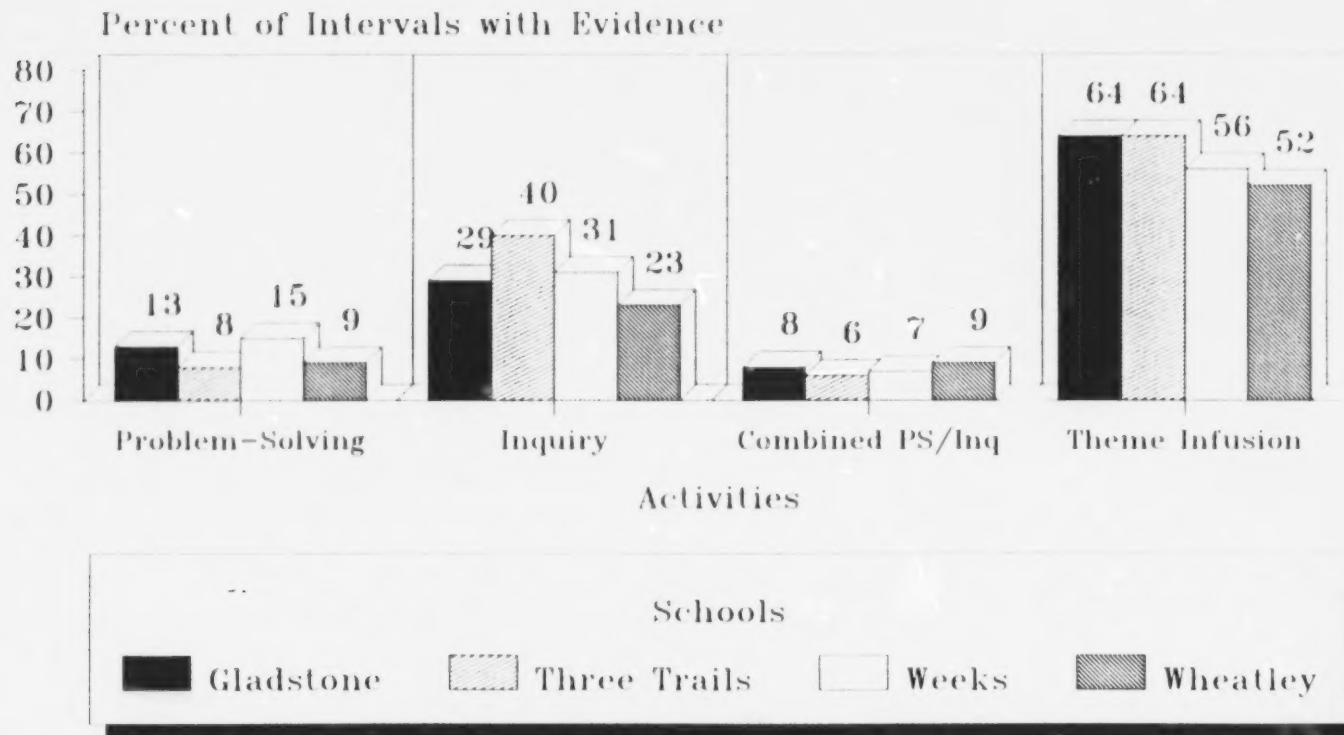
Alternately, when theme activities were examined across curricular areas, it was found that science/math instruction and classroom instruction were similar in opportunities for inquiry and problem-solving (see Figure 2). Further, slightly more problem-solving was observed in computer classes. Theme infusion was observed at a greater rate in science/math instruction and computer classes. Less infusion was found in regular classroom instruction and in support classes (art, physical education, etc.). Lastly, behavior disruptions were examined across curricular areas. While the rates are not overly discrepant, slightly more disruption occurred in support classrooms and regular classroom instruction than in theme classes. Interestingly, science/math and computer instructional time had the least amount of disruption which may indicate that students are more integrated (and interested) into the learning environment, spend more time on task, and are less likely to be distracted or disruptive.

Math/science infusion. The planning outlines for each elementary school reflect an emphasis upon the infusion of science and math into all curricular areas. Table 4 indicates that infusion was found in 59% of the observation intervals. When theme infusion was examined by curricular area (see Figure 2), it was found that the greatest frequency of infusion occurred in computer (66%) and theme classrooms (65%). Surprisingly, regular classroom instruction

Figure 1

Activities Observed by School:

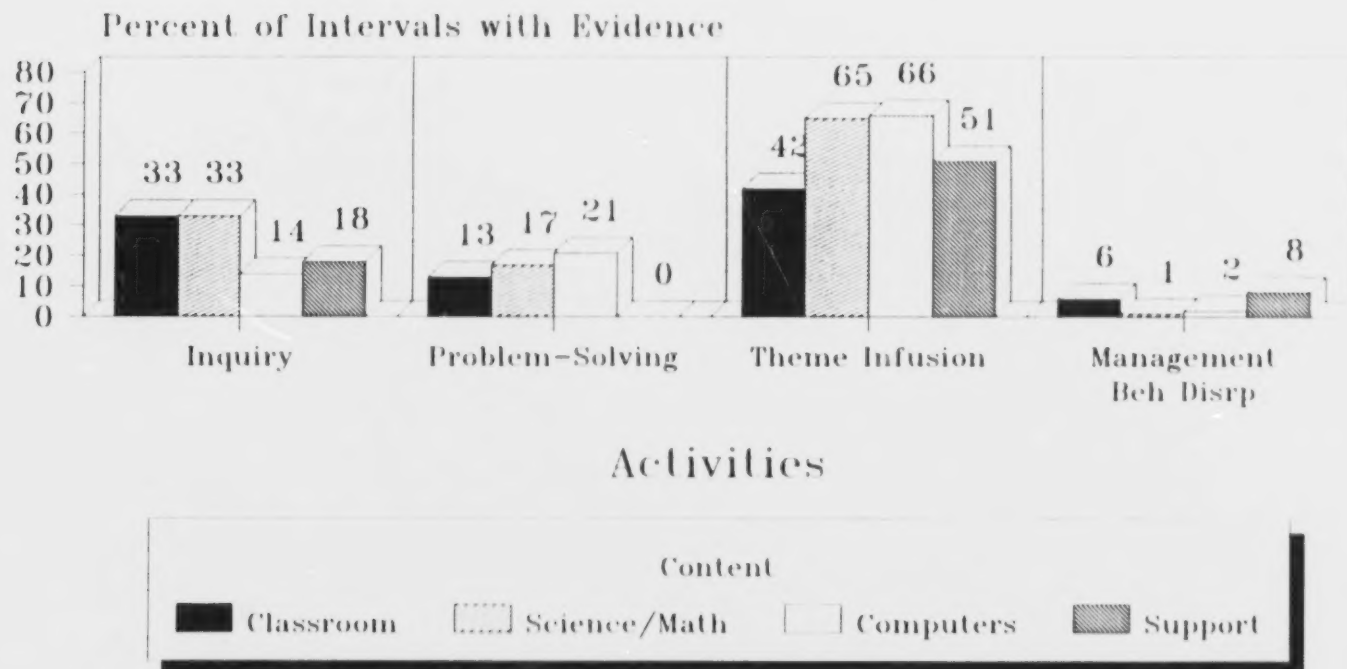
1990-1991



Note: Percentages are rounded

Figure 2

Activities Observed by Instructional Content: 1990-1991



Note: Percentages are rounded to the nearest whole percent.

had infused science and math at a rate (42%) lower than that found for computer, support, and theme instruction.

Classroom computers. Funding for the science/math elementary magnet program provides for the establishment of computer labs and computers in classrooms. Observers documented those classrooms in which computers were available for student use and observed the frequency in which the computers were utilized. Table 4 displays the results of these observations. The 'combined' results indicate that 18% of the 2,940 observation intervals found students utilizing classroom computers. Of particular interest was the finding that there was a wide range of utilization across the four schools. Gladstone students were observed using classroom computers during 48% of the observation intervals. Weeks students were observed using the computers during 13% of the observation intervals; Three Trails and Wheatley students were found to be using the computers during less than 10% of the observation intervals.

Core infusion. As a result of a direct request from district math/science resource leadership, observations were undertaken to identify the rate of infusion of English and social studies into math and science classroom instruction. Resource leadership indicated that while infusion of math/science into other content is a central feature of the program, math and science instruction should attempt to expose students to the interconnections of all human intellectual endeavors with math and science. Table 4 presents the results for core infusion. Results indicate that math and science instruction was infused with English and social studies during 50% of the 680 observation intervals completed during math and science instruction.

Experimentation. During 2,940 minutes of classroom observation, teacher efforts to incorporate experiments were in evidence in 31% of the observation intervals (see Table 4). Experimentation was evident if teachers were engaged in demonstrating, modeling, explaining, or actually conducting an experiment. Further, if students were engaged in any stage of experimentation (e.g., hypothesizing, collecting data, analyzing results), experimentation was noted as evident.

Opportunities for hands-on learning. When specific laboratory settings were examined for the extent of hands-on learning opportunities afforded students, it was found that a significant portion of the observation visits had evidence of hands-on learning (see Table 5). Students in science labs were observed to be engaged in hands-on learning in 67% of the observation visits, an increase of 10% from the previous year. When computer or com-

Table 5
Number & Percent of Visits in Which Hands-On Use of Math Manipulatives,
Science Equipment, Animal Handling, and Computer Use were Observed

Curriculum Areas Observed	Combined		Gladstone		Three Trails		Weeks		Wheatley	
	1989-90	1990-91	1989-90	1990-91	1989-90	1990-91	1989-90	1990-91	1989-90	1990-91
Science¹										
Hands-On Occurring	57%	67%	67%	64%	47%	57%	63%	75%	50%	62%
Hands-On Not Occurring	18%	11%	7%	21%	41%	0%	13%	0%	8%	15%
No Students in Room	25%	22%	26%	14%	12%	43%	25%	25%	42%	23%
Total	100%	100%	100%	99%	100%	100%	101%	100%	100%	100%
Computer/Math Labs^{1, 2, 3}										
Using Computers	73%	92%	73%	100%	2%	29%	88%	83%	43%	39%
Using Math Manipulatives	68%	77%	80%	100%	84%	57%	65%	50%	27%	39%
Some of Each	0%	5%	0%	0%	0%	14%	0%	0%	0%	0%
No Students Using Computers or Manipulatives	4%	10%	3%	0%	0%	0%	3%	0%	11%	15%
No Students in Lab	18%	13%	10%	0%	15%	0%	9%	19%	50%	8%
Animal Room¹										
Students Interacting with Animals	39%	35%	-- ⁴	-- ⁴	31%	43%	54%	58%	36%	31%
Students Not Interacting with Animals	28%	38%	--	--	38%	0%	15%	0%	29%	62%
No Students in Lab	32%	28%	--	--	31%	57%	31%	42%	36%	8%
Total	99%	101%	--	--	100%	100%	100%	100%	101%	101%

Note: Percentages are rounded to the nearest whole percent.

¹ Based on the following visits: (Gladstone, N= 14; Three Trails, N= 12; Weeks, N= 12; Wheatley, N= 13).

² Includes classrooms in which computer/math resource teacher is working as well as Computer Labs, Computer/Math Labs, and Math Labs.

³ Three Trails and Wheatley did not have computer labs installed until May, 1990.

⁴ Gladstone does not have an animal room.

puter/math labs were examined for use of computers, it was found that 92% of the observation visits had occurrences of hands-on learning through computer use. Similarly, students in math or computer/math labs were engaged 77% of time in solving math problems with math manipulatives. When compared to previous year results, evidence of computer and math hands-on learning was found in a larger number of observation visits. Student interaction with animals in an animal laboratory was observed during 35% of the observation visits, a decrease from the previous year of 4%.

Of particular importance is the finding reported for each curricular area under the heading: 'no students in lab/room', (see Table 5). When this category is removed from the analysis, significant differences are found. For example, under the category 'science', 22% of the observation intervals found no students in the room. When these observations are removed from consideration, 85% of the observations found hands-on learning in science labs. Similar results were found for the math and animal labs.

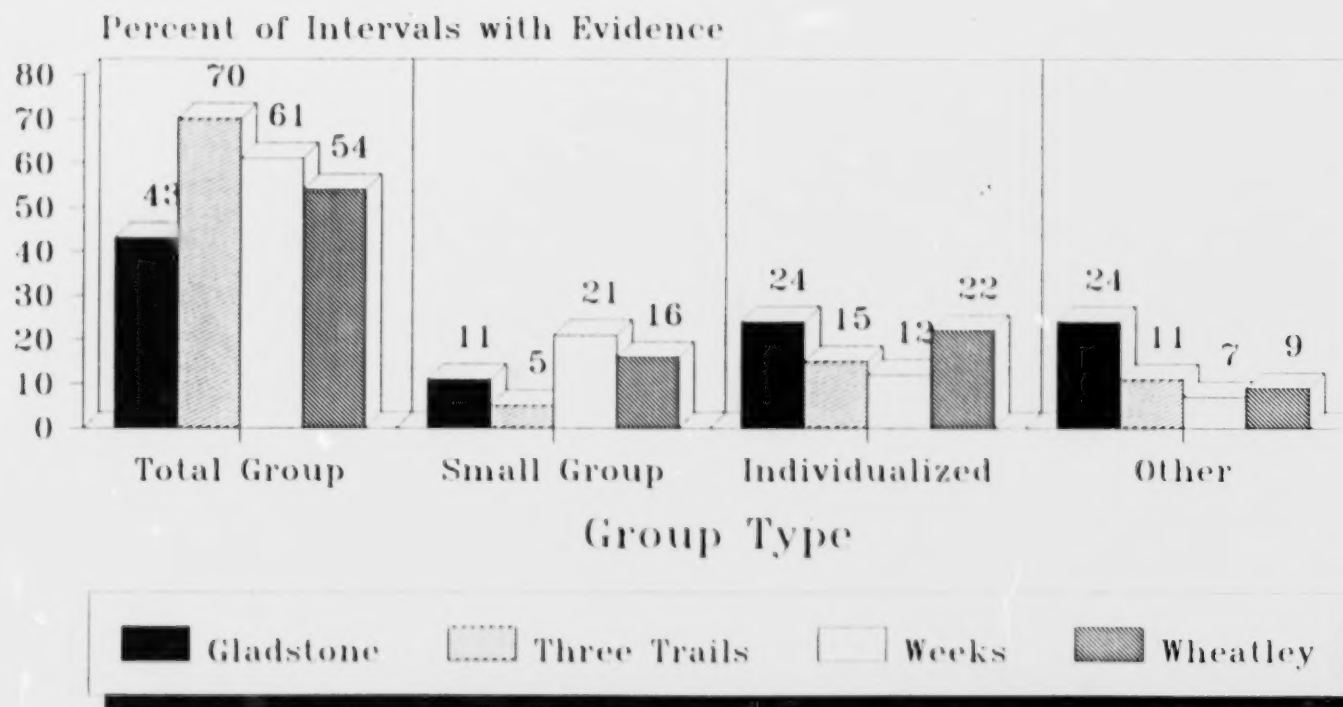
When school leadership were interviewed in late May they were asked if they believed the science, math, computer, and animal room resources were providing the kind of instruction and experiences they were designed to provide. Overwhelmingly, school leadership were satisfied with the level of exposure students were receiving and the support teachers had obtained. Additionally, leadership were asked if there were problems with the availability of hands-on learning materials (math manipulatives, and science equipment). School leadership indicated that there is an adequate amount of materials. Similarly, 90% of the teachers agreed that materials were available for instruction.

Instructional grouping. Additional observational data were collected in an effort to examine the mode of instruction utilized in classrooms. As Figure 3 demonstrates, the most frequently observed mode of instruction was total group instruction. Three Trails and Weeks teachers utilized this instructional grouping during more than 60% of the observation intervals. Individual instruction was provided to students during slightly less than a quarter of the observation intervals. Gladstone and Wheatley teachers utilized individualized instruction more frequently than did their counterparts. Small group instruction was observed in less than 25% of the observation intervals. Three Trails and Weeks teachers utilized this approach more frequently than did the other teachers. Groupings observed which were a combination of these approaches were recorded as 'other'.

Figure 3

Instructional Grouping by School

1990-1991



Note: Percentages are rounded to the nearest whole percent.

Physical evidence of science/math infusion. The collection of classroom observational data also included an inspection for physical evidence of the integration of the science and math theme in classrooms, labs, hallways, and student accessible locations throughout the building. In October, one visit was made to each of the four schools to document the extent of evidence of the magnet theme. Across the four schools, 106 different locations were examined (see Table 6). Observers looked for the presence of such items as math or science charts, posters, and graphs. Animals, fish and plants were documented as was the presence of science models and equipment, and math manipulatives. In particular, it is noteworthy that a large percentage of classrooms across the four schools had physical evidence of both math and science. In fact, more than 90% of the classrooms examined had physical evidence of the theme. Math manipulatives were seen in somewhat more than 50% of the classrooms examined. Science equipment was visible in at least 40% of the classrooms. When all sites were considered, more than 75% of the sites at each school had evidence of the science theme.

Special science/math-related activities. In addition to regular curricular offerings, students at the schools have been provided opportunities to experience a variety of science and math related field trips, special activities, and contests. During the 1990-91 year, students visited such events as the American Royal, and the Estimations Exhibit at the Town Pavilion. Students toured the Shawnee Mission Environmental Science Lab, the Burr Oak Woods Nature Center, the Kansas City Zoo, the Kansas City Water Works, the Kansas City Natural History Museum, and the planetarium at Southwest Science/Math Magnet High School. Students participated in the Kansas City Science Fair, the Missouri Council of Teachers of Mathematics (MCTM) math/computer-art poster contest, the MCTM regional competition and the STEPS Math Bee. (For a complete listing of the special opportunities provided to students, as reported by school leadership, see Appendix A.)

Perceptions

The perceptions of school leadership, teachers, students, and parents about their experience with the magnet program were gathered in the spring of the 1990-1991 year (see Tables 7, 8, and 9). Teacher perceptions also were gathered in the fall. Overall, these groups appear to be satisfied with the program at their school. School leadership are encouraged to examine perceptions of staff, students, and parents for their school to identify emerging areas of concern (see Appendix B).

Table 6
Physical Evidence of Math/Science Infusion by School, 1990-91
Science/Math Elementary Magnet Program

Site Evidence	Gladstone (N = 21) ¹			Three Trails (N = 25) ¹			Weeks (N = 34) ¹			Wheatley (N = 26) ¹		
	Evidence Math	Evidence Science	Evidence Absent	Evidence Math	Evidence Science	Evidence Absent	Evidence Math	Evidence Science	Evidence Absent	Evidence Math	Evidence Science	Evidence Absent
Classrooms²	62%	92%	8%	100%	100%	0%	87%	96%	4%	88%	88%	6%
Animal/Fish/Plants	-----	38%	-----	-----	87%	-----	-----	96%	-----	-----	63%	-----
Science Charts/Posters	-----	62%	-----	-----	93%	-----	-----	87%	-----	-----	88%	-----
Science Models	-----	77%	-----	-----	47%	-----	-----	78%	-----	-----	63%	-----
Science Equipment	-----	62%	-----	-----	40%	-----	-----	57%	-----	-----	38%	-----
Math Charts/Posters/Graphs	46%	-----	-----	47%	-----	-----	65%	-----	-----	81%	-----	-----
Math Manipulatives	54%	-----	-----	73%	-----	-----	87%	-----	-----	69%	-----	-----
Other Sites³	0%	60%	40%	20%	60%	30%	22%	67%	33%	25%	75%	13%
All Sites	43%	76%	24%	40%	76%	12%	69%	88%	13%	75%	83%	8%

Note: Percentages are rounded to the nearest whole percent.

¹ Number of locations (including classrooms) examined in a building.

² Classrooms other than math or science.

³ Library, cafeteria, music room, gym, hallways, auditorium, art room, resource rooms.

Table 7
Teacher Perceptions 1990, 1991
Science /Math Elementary Magnet Program

Statement	Response Alternatives	1989-90		1990-91	
		N	%	N	%
1. Science and mathematics theme is clear.	Agree	91	96%	100	99%
	Disagree	4	4%	1	1%
2. Informed about magnet school plan.	Agree	88	95%	98	97%
	Disagree	5	5%	3	3%
3. Believe school is implementing magnet theme according to identified goals and objectives.	Agree	78	85%	96	96%
	Disagree	14	15%	4	4%
4. Building magnet theme support staff provided support needed to implement magnet theme.	Agree	68	82%	94	95%
	Disagree	15	18%	5	5%
5. Building level administrative staff provided support needed to implement magnet theme.	Agree	71	80%	79	83%
	Disagree	18	20%	16	17%
6. Able to infuse magnet curriculum into basic curricula of district.	Agree	82	94%	99	97%
	Disagree	5	6%	3	3%
7. Satisfied with quality of instructional leadership received.	Agree	74	79%	74	76%
	Disagree	20	21%	23	24%
8. Satisfied with the quantity of instructional leadership received.	Agree	----	----	72	75%
	Disagree	----	----	24	25%
9. Feel professionally challenged teaching in science/math program.	Agree	82	91%	93	95%
	Disagree	8	9%	5	5%
10. Satisfied with assistance received from animal resource teacher.	Agree	64	84%	70	89%
	Disagree	12	16%	9	11%
11. Satisfied with assistance received from computer resource teacher.	Agree	54	79%	86	90%
	Disagree	14	21%	10	10%
12. Satisfied with assistance received from math resource teacher.	Agree	67	82%	80	87%
	Disagree	15	18%	12	13%
13. Satisfied with assistance received from science resource teacher.	Agree	74	91%	90	95%
	Disagree	7	9%	5	5%
14. Given information and instruction needed to operate computer(s) in classroom.	Agree	27	54%	68	82%
	Disagree	19	46%	15	18%
15. Given information and instruction needed to use computer software.	Agree	28	56%	73	84%
	Disagree	22	44%	14	16%
16. Able to apply staff development offered during the summer and the school year.	Agree	71	80%	89	90%
	Disagree	18	20%	10	10%
17. Satisfied with staff development/in-service sessions regarding math/science infusion.	Agree	69	78%	79	85%
	Disagree	20	22%	14	15%
18. Able to get materials needed to implement the science/math magnet theme.	Agree	69	80%	89	90%
	Disagree	17	20%	10	10%

BEST COPY AVAILABLE

Table 7 (continued)
Teacher Perceptions 1990-1991
Science/Math Elementary Magnet Schools

Statement	Response Alternatives	1989-90		1990-91	
		N	%	N	%
19. I have access to math manipulatives.	Agree	--	---	91	96%
	Disagree	--	---	4	4%
20. Overall, what rating would you give to this school this year?	Excellent	35	37%	50	49%
	Good	26	27%	24	24%
	Average	15	16%	13	13%
	Fair	10	11%	13	13%
	Poor	9	10%	2	2%

Note: Percentages are rounded to the nearest whole percent.

School leadership perceptions. School leadership were asked to provide their perception of the implementation efforts in the current year. Among other comments, Gladstone leadership indicated: "We are happy that our test scores on the ITBS test are up and they are at or above the national norms, which reflects my belief that teachers are doing a better job."

Weeks leadership noted that progress was evident during the current year: "I believe we're getting better. Teachers can't be expected to change overnight, they also need to learn to 'connect or process information'."

Wheatley leadership believed the program has begun to influence how students think. "Students are beginning to show improvement in math and science. The effort is beginning to make a difference. Students are doing more scientific thinking."

Three Trails leadership indicated that problematic areas in the first year were now functioning smoothly and all materials, equipment, and facility shortcomings had been addressed, with the exception of animal housing problems. Further, "I feel that the three labs are doing a good job and the teachers perceive them the same way."

Teacher perceptions. Teacher questionnaires were administered on-site with evaluation personnel during two regularly scheduled faculty meetings. The questionnaires queried teachers about their perceptions of five different areas of implementation: understanding of magnet plan/theme, level of support (building, district) received, availability of materials and information, resource teacher assistance, and staff development/in-service. Table 7 presents the results of teacher responses to questionnaire items.

Table 8
Student Perceptions, 1990, 1991
Science/Math Elementary Magnet Program

Item Content	Response Alternatives	1990 (N= 405)		1991 (N= 535)	
		N	%	N	%
1. I am glad I go to _____.	Yes	340	84%	441	82%
	No	65	16%	94	18%
2. I am learning a lot on the computers at _____.	Yes	336	83%	453	85%
	No	68	17%	82	15%
3. I have learned about different kinds of animals this year. ¹	Yes	274	88%	372	88%
	No	37	12%	51	12%
4. I am learning a lot about math this year.	Yes	385	95%	499	93%
	No	20	5%	36	7%
5. I am learning a lot about science this year.	Yes	375	93%	480	90%
	No	30	7%	55	10%
6. I have enjoyed my field trips this year.	Yes	363	90%	454	85%
	No	42	10%	81	15%
7. I enjoy going to the computer room. ²	Yes	283	91%	478	89%
	No	29	9%	57	11%
8. I enjoy having math teacher come to my room.	Yes	367	91%	422	79%
	No	38	9%	113	21%
9. I enjoy going to the science room.	Yes	375	93%	459	86%
	No	29	7%	76	14%
10. I have learned to do math problems on the computer this year. ⁴	Yes	203	92%	255	93%
	No	18	8%	20	7%
11. I have gotten to solve interesting math problems when math teacher comes to my room.	Yes	349	86%	419	78%
	No	55	14%	116	22%
12. I have gotten to do interesting science projects and experiments in the science room this year.	Yes	353	87%	482	90%
	No	51	13%	53	10%
13. The math room lessons have helped me learn more about math this year.	Yes	351	87%	433	81%
	No	54	13%	102	19%
14. The lessons in the science room have helped me learn more about science this year.	Yes	352	87%	465	87%
	No	51	13%	70	13%
15. I like doing math problems.	Yes	312	77%	403	75%
	No	93	23%	132	25%
16. I like doing science projects and experiments.	Yes	377	93%	472	88%
	No	28	7%	63	12%

Table 8 (continued)
Student Perceptions, 1990, 1991
Science/Math Elementary Magnet Program

Item Content	Response Alternatives	1990 (N= 405)		1991 (N= 535)	
		N	%	N	%
17. I like math.	Yes	333	82%	411	77%
	No	72	18%	124	23%
18. I like science.	Yes	362	89%	443	83%
	No	43	11%	92	17%
19. I feel good about my school.	Yes	313	78%	404	76%
	No	90	22%	131	24%
20. I have interesting things to do in the before-school program. ³	Yes	108	89%	111	75%
	No	13	11%	37	25%
21. I have interesting things to do in the after-school program. ⁴	Yes	116	91%	155	90%
	No	11	9%	17	10%
22. Gotten to be in a Science Fair this Year. ⁵	Yes	111	60%	198	77%
	No	73	40%	60	23%
23. Enjoy doing math problems on the computer. ⁵	Yes	122	70%	189	74%
	No	53	30%	66	26%
24. I have a chance to try things out and see what works best. ⁵	Yes	133	72%	197	77%
	No	51	28%	59	23%
25. I would like to have a job when I grow up that lets me do science projects. ⁵	Yes	57	31%	74	29%
	No	128	69%	183	71%
26. I would like to have a job when I grow up that lets me work with math. ⁵	Yes	97	53%	136	53%
	No	87	47%	122	47%
27. I would like to have a job when I grow up that lets me use computers.	Yes	137	74%	192	74%
	No	47	26%	66	26%
28. I would like to have a job when I grow up that lets me care for animals. ⁵	Yes	69	50%	117	46%
	No	70	50%	139	54%

Note: Percentages are rounded to the nearest whole percent.

¹ Gladstone does not have animal resources.

² Three Trails's computer room was not available for use as of May 1.

³ Only 1st, 2nd, and 3rd grades.

⁴ Only Extended Day participants responded to this item.

⁵ Only 4th, 5th, and 6th grades.

Teacher understanding of magnet plan/theme. Responses to items 1, 2, and 3 indicate that teachers perceived themselves to be well informed about the science/math theme (99%) and the magnet school plan (97%). Ninety-six percent of the teachers believed their school was implementing the magnet theme according to the identified goals and objectives. Additionally,

Table 9
Parent Perceptions, 1990, 1991
Science/Math Elementary Magnet Program

Item Content	1990 (N= 204)		1991 (N= 309)	
	Agree	Disagree	Agree	Disagree
1. Satisfied with overall program.	86%	14%	91%	9%
2. Science/math theme is clear.	85%	15%	90%	10%
3. Know how students selected for magnet schools.	42%	58%	29%	71%
4. Student selection process is fair. ¹	50%	50%	60%	40%
5. Magnet application handled in a reasonable amount of time.	88%	12%	87%	13%
6. Attended last parent/teacher conference	---	---	63%	37%
7. Child applied to be at _____.	---	---	63%	37%
8. Satisfied with degree of computer use/activities.	87%	13%	93%	7%
9. Satisfied with child's progress in math.	85%	15%	89%	11%
10. Satisfied with child's progress in science.	89%	11%	88%	12%
11. Satisfied with child's progress in other basic skills.	84%	16%	89%	11%
12. Child attends extended day activities.	44%	56%	38%	63%
13. Extended day a reason for enrolling child at _____.	16%	84%	41%	59%
14. Satisfied with extended day activities. ²	92%	8%	93%	7%
15. Extended day provides proper supervision for students. ²	92%	8%	94%	6%
16. Child uses district transportation.	72%	28%	68%	32%
17. District transportation is timely. ³	92%	8%	87%	13%
18. District transportation is safe. ³	85%	15%	95%	5%
19. Principal is responsive to my concerns.	85%	15%	93%	7%
20. Parent participation is welcome at _____.	94%	6%	96%	4%
21. Would recommend school to other parents.	88%	12%	91%	9%

Note: Percentages are rounded to the nearest whole percent.

¹ Of those who know how students are selected, (1990, N = 84; 1991, N = 87).

² Of those whose children attend extended day classes, (1990, N = 88; 1991, N = 113).

³ Of those whose children use district transportation, (1990, N = 145; 1991, N = 209).

teachers reported being able to infuse the magnet curriculum into basic curricula of the district (item 6, 97%). This finding would suggest that teachers understand the process and outcomes of science/math infusion.

Level of support received. Teacher responses indicated that support, which is perceived to be necessary to implement the magnet theme, has been provided. Ninety-five percent of the teachers indicated they have been provided support from building level resource teachers (item 4). Similarly, 83% of the teachers indicated they had received support from building level administrative support staff (item 5).

Availability of materials and information. Teachers report having received materials needed to implement the magnet theme (90%, item 18). Teachers were also asked to indicate whether they had access to math manipulatives, a necessary commodity to implement the math component of the magnet program. Ninety-six percent of the teachers reported having access to these materials.

Items 14 and 15 asked teachers to indicate whether they have received information and instruction needed to operate computers and use computer software in their classrooms. Approximately 86% of the teachers had computers in their classrooms. Of those teachers who did have computers, 82% had received information or instruction to operate the computers. Similarly, 84% of the teachers had received information or instruction to use computer software on the computers.

Resource teacher assistance. Classroom teachers were asked to indicate their degree of satisfaction with resource teacher assistance (see items 10-13). Overall, teachers believed resource teachers were a valuable source of assistance. A large percentage of the teachers reported satisfaction with the assistance of the animal resource teacher (89%); computer resource teacher (90%); math resource teacher (87%); and science resource teacher (95%).

Staff development/instructional leadership. Teachers, as a whole, are satisfied with staff development regarding the magnet theme infusion (item 17; 85%) and 90% have been able to apply the knowledge gained to their teaching (item 16).

While the great majority of teachers were satisfied with staff development activities, teachers were somewhat less satisfied with the degree of instructional leadership provided by the administrative team in their building. When teachers were asked if they were satisfied with the quality of instructional leadership, 76% reported satisfaction (item 7). Similarly, when asked about the quantity of instructional leadership, 75% were satisfied (item 8). Teachers

were also asked whether they felt professionally challenged teaching in the science/math program (item 9). Ninety-five percent of the teachers reported feeling professionally challenged.

Safety. Teachers were asked how safe they felt teaching at their school (i.e., physical safety). Eighty-two percent of the teachers assigned to Gladstone felt "very safe" and 18% felt "moderately safe/unsafe." Teachers assigned to Three Trails reported feeling "very safe" (92%) with 8% feeling "moderately safe/unsafe". Weeks and Wheatley teachers reported feeling much less safe than did their peers at Gladstone or Three Trails. Forty percent of Weeks teachers reported feeling "very safe." While only 29% of Wheatley teachers felt "very safe" Eleven percent of Weeks teachers, and 17% of Wheatley teachers, felt "very unsafe" while at school. Forty-nine percent of Weeks teachers, and 54% of Wheatley teachers, felt "moderately safe/unsafe."

Overall rating of the magnet school program. Teacher ratings of the overall implementation of the magnet school program at their school were favorable (see item 20). Seventy-three percent of the teachers rated the program as good or excellent. Thirteen percent rated the program as average, and 13% rated the program as fair. Only 2% rated the program as poor.

When ratings were examined by school, Gladstone and Three Trails teachers rated their programs substantially different than did teachers at Wheatley and Weeks (see Table B-1 in Appendix B). Seventy-seven percent of the teachers at Gladstone rated the program as excellent. Ninety-two percent of the Three Trails teachers rated the program as excellent. Only 13% of the teachers at Wheatley felt the program was excellent. Similarly, 32% of the teachers at Weeks rated the program as excellent. When compared to teacher ratings at Gladstone and Three Trails, teachers at Wheatley, and to a lesser extent Weeks, appear less satisfied with most aspects of the science/math program at their school.

Student perceptions. During the spring term, students were asked to complete an age-appropriate questionnaire about their magnet program experience. Students were asked to respond to questions about their school, computers, animal room, science and math, and the extended day sessions. Half of all classrooms in each school were randomly selected to receive the questionnaire.

In general, the 535 students surveyed reported a positive school experience (see Table 8). Items 1 and 19 asked the student to report perceptions about their school. Eighty-two percent of the students were glad they go to their school and 76% felt good about their school.

Other items explored student perceptions of their science theme-related experiences. Students reported enjoying science (item 18, 83%) and liked doing science experiments and projects (item 16, 88%). Similarly, 86% enjoyed going to the science room or lab (item 9). Students felt they have learned a lot in science this year (item 5, 90%) and have had the opportunity to do interesting science projects in the science room (item 12, 90%). Seventy-seven percent of the fourth and fifth graders have had the opportunity to be in a science fair this year (item 22).

Eight items explored student perceptions of their math theme-related experiences. Students were typically less satisfied with the math component, when compared to the science component of the theme. Furthermore, ratings of satisfaction have declined since the first year of implementation. Students report enjoying math, but to an extent less than science (item 17, 77%) and like doing math problems (item 15, 75%). Similarly, students appeared to enjoy going to the math lab or having the math teachers come to their room (item 8, 79%).

Using the computer to work on math problems was examined. Although 93% of the students have learned to do math problems on the computer (item 10), only 74% enjoy doing these problems (item 23). This is supported by item 15, in which 75% of the students reported enjoying math problems. Generally, students feel as if they have learned a lot about math this year (item 13, 81%) and have had the opportunity to solve interesting math problems when the math teacher comes to their classroom (item 11, 78%).

A final series of questions probed the depth of student interest in science, math, computer science, and animal care (see items 25-28). While these questions asked students whether they would like a job in these areas when they grow up, the intent was to determine whether students would like to engage in these behaviors in the future. As such, less than one-third of the students would like to have a job in a science field. More than half would like a job working with math. Almost three-quarters would like to work with computers. Slightly less than one-half would like to work with animals. Interestingly, students at Gladstone were more likely to want to work with animals than were students at the other three schools (see Table B-2 in Appendix B). This finding was surprising because Gladstone does not have animal resources. It was expected that students who had been exposed to animal study would be more likely to express an interest in animal studies as a future endeavor.

Additional student perceptions are reported in Table B-2 in Appendix B. Leadership at each school is encouraged to examine Table B-2 for the specific responses of their students.

Parent perceptions. Parent perceptions were gathered once (mid spring). Parents of 309 students were randomly selected from a district listing of enrolled students. Through a telephone interview, parents were asked to respond to a series of questions probing their perceptions of the science/math program, the school, and their child's educational progress in the program. An examination of Table 9, indicated that parents were typically satisfied with the magnet program at their school (item 1, 91%). In fact, only one area appears problematic for parents (see items 3 and 4). Less than one-third of the parents knew how students were selected for specific magnet schools (29%) and of those who did know, parents were split in terms of the fairness/unfairness of this process (60%/40%). Otherwise, in most cases, greater than 80% of the parents were satisfied with the various aspects of the magnet program. Parents reported understanding the purpose and scope of the magnet theme (item 2, 90%), and appeared quite satisfied with their child's progress in the math program (item 9, 89%), the science program (item 10, 88%), and basic skills instruction (item 11, 89%).

Most parents reported feeling satisfied with the efficiency (item 17, 87%) and safety (item 18, 95%) of district transportation. Most importantly, parents felt the principal was responsive to their concerns (item 19, 93%); felt their participation was welcome at the school (item 20, 96%); and would recommend the school to other parents (item 21, 91%).

When parents were asked to rate certain aspects of their child's educational environment on a 5 point scale (Excellent to Poor), perceptions appeared to suggest that parents not only are satisfied, as seen in Table 9, but are typically rating program aspects as Excellent or Good (see Table B-4 in Appendix B). In all areas examined, greater than 70% of the parents rated selected program aspects as Excellent or Good. Additional parent perceptions can be examined in Appendix B, Tables B-5 and B-6.

Extended Day

An extended day program has been established at each of the four elementary magnet schools. This program provides for the educational and supervisory needs of students before and after regular school hours. In general, the program offers students remedial and enrichment activities in math and science as well as other curricular areas. Opportunities exist for students to enhance their interpersonal skills, share learning experiences, improve academic performance, and improve their self-image. Clubs and courses are offered as well as tutoring and physical fitness activities. For example, students have the opportunity to participate in

theatre, aerobics, music lessons, keyboarding, and gymnastics (see Appendix C for a listing of extended day activities offered at the math/science elementary schools).

The extended day program at the new elementary magnet schools appears to be a much utilized service for parents. Of the 1,411 students enrolled in the four schools, 894 (63%) students were enrolled in the extended day program (see Table 10). Proportionately, each school enrolled greater than 45% of their students in extended day sessions, with Gladstone enrolling 97% of their students in the extended day program. Alternately, Three Trails enrolled 46% of their students in the extended day sessions.

The afternoon session had the highest enrollment (41%). Approximately 34% of the students enrolled in both the morning and afternoon sessions, with 25% of the students enrolled in the morning session only (see Table 10).

When the racial composition of extended day students was compared with that of the racial composition of the total school enrollment, each school appeared to be enrolling a similar percent of minority and non-minority students as that of the total school population. The

Table 10
Science/Math Elementary Magnet Program
Minority and Non-Minority Extended Day Enrollment, 1991

School	Morning		Afternoon		Both		Total	
	Only		Only		AM & PM			
Ethnic	N	%	N	%	N	%	N	%
Gladstone								
Minority	14	48%	62	58%	66	58%	142	57%
Non-Minority	15	52%	45	42%	48	42%	108	43%
Three Trails								
Minority	14	50%	22	54%	27	52%	63	52%
Non-Minority	14	50%	19	46%	25	48%	58	48%
Weeks								
Minority	85	93%	115	97%	80	93%	280	95%
Non-Minority	6	7%	4	3%	6	7%	16	5%
Wheatley								
Minority	71	91%	89	93%	47	89%	207	91%
Non-Min.	7	9%	7	7%	6	11%	20	9%
Combined								
Minority	184	81%	288	79%	220	72%	692	77%
Non-Minority	42	19%	75	21%	85	28%	202	23%

Note: Percentages are rounded to the nearest whole percent. Figures are current as of December 1, 1990.

overall racial composition of all students in the extended day program is 77% minority/23% non-minority. The overall racial composition of the all (K-5) students enrolled in the four elementary schools is 76% minority/24% non-minority (see Table 2).

Students and parents were generally satisfied with the extended day program. Students were asked if they had interesting activities in the morning and afternoon extended day sessions (see items 20 and 21 in Table 8). Ninety percent of the students indicated that they had experienced interesting activities in the afternoon session. Seventy-five percent believed the activities were interesting in the morning session.

Parents are satisfied with the extended day program (item 14, 93%). More than 40% of the parents indicated that they had enrolled their child in the school because of the extended day program (see item 13 in Table 9). Ninety-four percent believed the extended day program provided proper supervision for their child (see item 15 in Table 9).

Achievement

ITBS. Student achievement data for the spring 1991 ITBS test administration have been collected from the district's Testing Office. Table 11 presents ITBS achievement data for 1989, 1990, and 1991 by school, grade level, minority status, and content tested. In addition, district and national norms are presented for reference. The figures presented are percentile ranks and represent the percentile rank associated with mean grade equivalent scores for science, math, reading, and language subtests.

Math achievement. Briefly, it can be seen from Table 11 and Figure 4 that math achievement in kindergarten and first grade is above the national norm for each of the four schools. Alternately, for grades two through five, achievement is less consistent. Wheatley students, in grades two through five are below the national norm. Three Trails students are above the national norm at grades two through four. Weeks students are above norm at all grade levels. Gladstone students are above the national norm in all grades with the exception of grade four. In general, it can be seen that Gladstone, Three Trails, and Weeks students typically have larger percentile ranks than do the Wheatley students.

When math achievement was examined by minority status of students, non-minority students typically performed above the national norm and had higher scores than their minority counterparts (see Figures 5a through 5d). Minority students were above the national norm at: Gladstone in kindergarten, first and third grades; Three Trails in kindergarten

Table 11
Iowa Tests of Basic Skills Percentile Ranks
Science/Math Elementary Magnet Program
1989-1991

School	Science					Math					Reading					Language						
Grade	Ethnic	1989	1990	1991	Dist. Nat'l.	1989	1990	1991	Dist. Nat'l.	1989	1990	1991	Dist. Nat'l.	1989	1990	1991	Dist. Nat'l.	1989	1990	1991	1991	Norm
					Norm				Norm				Norm				Norm					
Gladstone																						
Kindergarten		---	---	---	---	---	56	66	63	50	---	82	---	---	50	---	53	67	60	50		
Minority		---	---	---		---	46	58			---	80	---			---	41	58				
Non-Minority		---	---	---		---	74 ¹	78			---	87 ¹	---			---	69 ¹	78				
First		---	72	88	67	50	---	69	80	64	50	---	69	71	51	50	---	85	89	70	50	
Minority		---	42	84			---	56	76			---	49	62			---	72	85			
Non-Minority		---	92 ¹	92			---	86 ¹	87			---	87	80			---	96 ¹	93			
Second		---	52	71	58	50	---	66	52	62	50	---	54	46	47	50	---	63	54	61	50	
Minority		---	32	67			---	50	45			---	52	34			---	55	47			
Non-Minority		---	78 ¹	74			---	87 ¹	59			---	59 ¹	59			---	75 ¹	63			
Third		---	73	79	58	50	---	59	57	48	50	---	50	47	44	50	---	67	65	57	50	
Minority		---	61	77			---	46	51			---	40	45			---	53	61			
Non-Minority		---	84 ¹	83			---	72 ¹	64			---	63 ¹	49			---	76 ¹	69			
Fourth		---	79	74	54	50	---	77	48	45	50	---	53	40	39	50	---	68	52	49	50	
Minority		---	70	69				64	34			---	40	30			---	59	47			
Non-Minority		---	89 ¹	80				89 ¹	62			---	71 ¹	50			---	81 ¹	58			
Fifth		---	68	76	52	50	---	47	54	41	50	---	36	51	39	50	---	44	51	47	50	
Minority		---	67	69				43	44			---	35	40			---	45	42			
Non-Minority		---	69 ¹	84				55 ¹	65			---	39 ¹	62			---	43 ¹	61			

Table 11 (continued)
Iowa Tests of Basic Skills Percentile Ranks
Science/Math Elementary Magnet Program
1989-1991

School Grade Ethnic	Science					Math					Reading					Language				
	1989	1990	1991	Dist. 1991	Nat'l. Norm	1989	1990	1991	Dist. 1991	Nat'l. Norm	1989	1990	1991	Dist. 1991	Nat'l. Norm	1989	1990	1991	Dist. 1991	Nat'l. Norm
Three Trails																				
<u>Kindergarten</u>	---	---	---	---	---	68	61	67	63	50	86	79	---	---	50	69	59	66	60	50
Minority	---	---	---			88 ¹	58	62			95 ¹	73	---			78 ¹	43	63		
Non-Minority	---	---	---			67	66	74			84	84	---			69	73	70		
<u>First</u>	79	76	71	67	50	60	66	66	64	50	46	55	40	51	50	52	74	55	70	50
Minority	---	82 ¹	64			45 ¹	74	52			42 ¹	67	28			39 ¹	79	35		
Non-Minority	80	75	80			60	62	84			47	51	57			52	70	75		
<u>Second</u>	53	65	63	58	50	70	66	64	62	50	60	53	56	47	50	64	62	66	61	50
Minority	35 ¹	38	58			57 ¹	47	60			39 ¹	40	45			45 ¹	50	66		
Non-Minority	61	73	66			75	72	68			39	54	64			67	63	67		
<u>Third</u>	64	84	79	58	50	51	57	59	48	50	47	50	59	44	50	61	60	62	57	50
Minority	51	80	69			36	48	55			34	46	47			49	52	57		
Non-Minority	68	88	83			58	71	61			55	55	65			68	70	65		
<u>Fourth</u>	45	51	71	54	50	40	33	58	45	50	36	28	52	39	50	41	42	64	49	50
Minority	40	50	64			37	33	54			30	25	45			47	40	57		
Non-Minority	65	67	77			59	56	64			59	48	59			64	55	70		
<u>Fifth</u>	43	52	63	52	50	39	39	45	41	50	35	44	51	39	50	36	48	56	47	50
Minority	46	49	53			52	38	38			45	39	42			55	46	51		
Non-Minority	54	63	71			53	60	53			54	65	59			51	69	61		

Table 11 (continued)
Iowa Tests of Basic Skills Percentile Ranks
Science/Math Elementary Magnet Program
1989-1991

School	Science					Math					Reading					Language				
	Grade	1989	1990	1991	Dist. Nat'l.	1989	1990	1991	Dist. Nat'l.	1989	1990	1991	Dist. Nat'l.	1989	1990	1991	Dist. Nat'l.			
Ethnic	1991				Norm				1991				Norm				1991	Norm	1991	Norm
Weeks																				
Kindergarten	---	---	---	---	---	68	61	61	63	50	72	78	---	---	50	51	59	62	60	50
Minority	---	---	---	---	---	57	83	57			71	74	---			52	55	57		
Non-Minority	---	---	---	---	---	90	75 ¹	78 ¹			---	84 ¹	---			---	68 ¹	75		
First	36	56	69	67	50	60	66	55	64	50	42	44	45	51	50	65	59	71	70	50
Minority	36	53	69			38	60	52			42	41	45			63	57	72		
Non-Minority	--	89	86 ¹			---	93 ¹	90 ¹			---	85 ¹	43 ¹			---	85 ¹	36 ¹		
Second	24	47	60	58	50	70	66	64	62	50	32	31	38	47	50	56	50	58	61	50
Minority	24	47	60			51	52	63			32	31	37			57	49	58		
Non-Minority	---	60 ¹	68 ¹			---	70 ¹	76 ¹			---	53 ¹	56 ¹			---	70 ¹	61 ¹		
Third	34	58	70	58	50	51	57	50	48	50	32	45	35	44	50	48	52	53	57	50
Minority	34	56	69			31	47	49			31	45	34			47	50	53		
Non-Minority	---	77 ¹	74 ¹			---	78 ¹	58 ¹			---	56 ¹	42 ¹			---	67 ¹	55 ¹		
Fourth	51	47	72	54	50	40	33	54	45	50	24	26	35	39	50	38	42	52	49	50
Minority	51	46	71			31	40	53			25	25	36			39	40	51		
Non-Minority	---	62 ¹	80 ¹			---	64 ¹	60 ¹			---	45 ¹	30 ¹			---	50 ¹	62 ¹		
Fifth	42	61	64	52	50	39	39	60	41	50	36	31	33	39	50	46	43	48	47	50
Minority	43	61	64			50	35	60			36	31	32			47	43	49		
Non-Minority	---	---	67 ¹			---	---	45 ¹			---	---	36 ¹			---	---	40 ¹		

Table 11 (continued)
Iowa Tests of Basic Skills Percentile Ranks
Science/Math Elementary Magnet Program
1989-1991

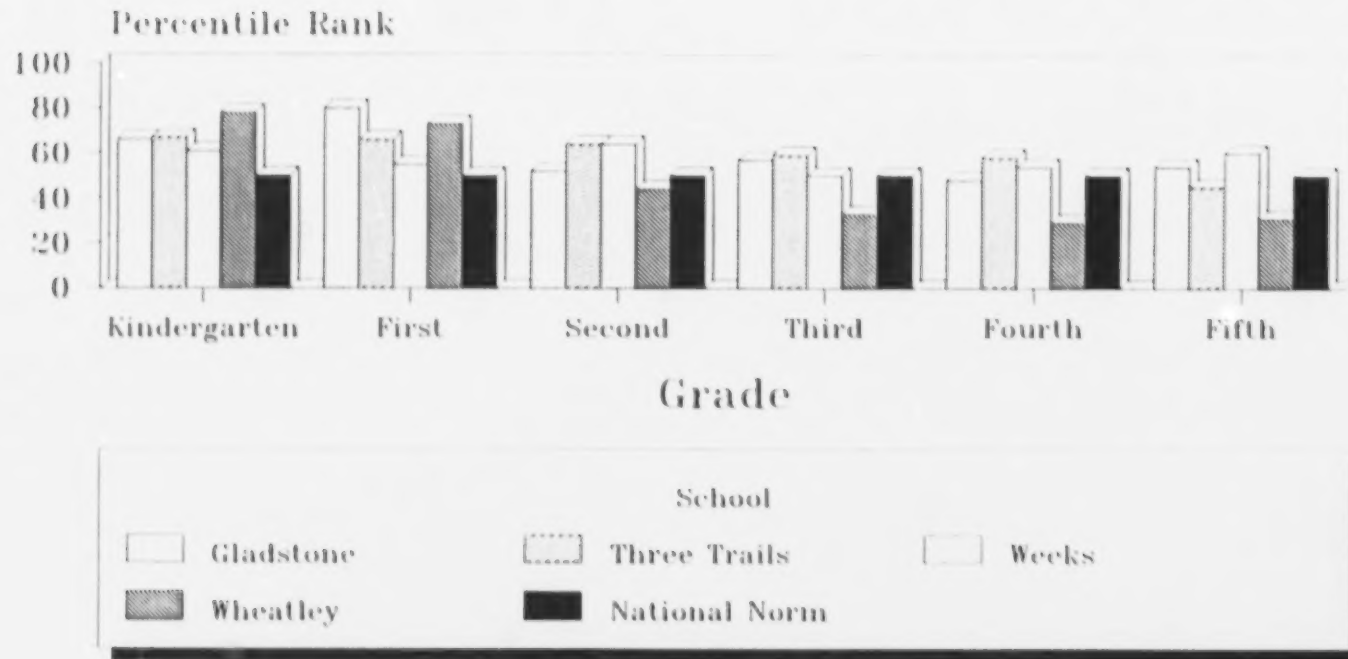
School	Science					Math					Reading					Language						
	Grade	Ethnic	1989	1990	1991	Dist. 1991	Nat'l. Norm	1989	1990	1991	Dist. 1991	Nat'l. Norm	1989	1990	1991	Dist. 1991	Nat'l. Norm	1989	1990	1991	Dist. 1991	Nat'l. Norm
Wheatley																						
Kindergarten			---	---	---	---	---	60	82	78	63	50	65	82	---	---	50	40	62	81	60	50
Minority			---	---	---			62	83	71			65	75	---			45	64	77		
Non-Minority			---	---	---			19 ¹	74	89			63 ¹	88	---			1 ¹	58	89		
First			29	40	66	67	50	40	37	73	64	50	39	27	49	51	50	61	58	63	70	50
Minority			29	41	56			40	32	65			40	26	48			58	56	59		
Non-Minority			---	60 ¹	82			---	72 ¹	89			---	25 ¹	53			---	56 ¹	73		
Second			46	36	49	58	50	34	38	44	62	50	33	33	34	47	50	38	38	57	61	50
Minority			43	36	47			32	33	42			31	31	33			31	34	58		
Non-Minority			49 ¹	---	64			54 ¹	---	57			15 ¹	---	36			10 ¹	---	49		
Third			21	45	54	58	50	27	18	33	48	50	16	26	33	44	50	36	36	44	57	50
Minority			21	46	56			23	17	33			16	26	35			32	36	46		
Non-Minority			---	34 ¹	35 ¹			---	26 ¹	24 ¹			---	33 ¹	11 ¹			---	34 ¹	22 ¹		
Fourth			36	43	44	54	50	31	28	29	45	50	24	28	27	39	50	40	40	34	49	50
Minority			36	39	43			31	21	27			24	26	26			36	38	32		
Non-Minority			---	62 ¹	47 ¹			---	29 ¹	45 ¹			---	38 ¹	36 ¹			---	55 ¹	44 ¹		
Fifth			35	41	46	52	50	32	29	31	41	50	29	33	26	39	50	42	42	39	47	50
Minority			36	34	46			32	28	30			30	31	26			36	42	41		
Non-Minority			25 ¹	93 ¹	50			17 ¹	65 ¹	33			11 ¹	77 ¹	27			19 ¹	83 ¹	30		

Note: Percentile ranks are based on mean grade equivalent scores. Ethnic group percentile ranks may not represent all students tested as some students did not report an ethnic code.

¹ Based on less than 10 students.

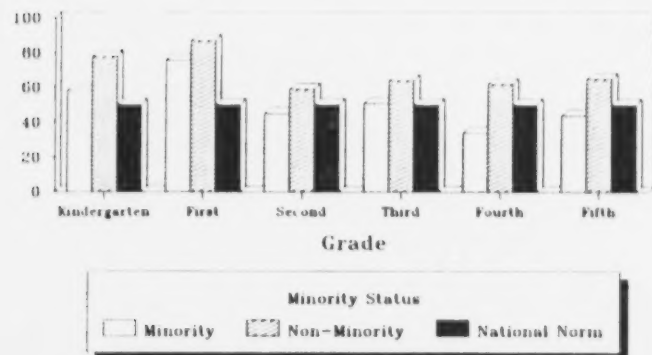
Figure 4

ITBS Math Achievement by School and by Grade, 1990-1991



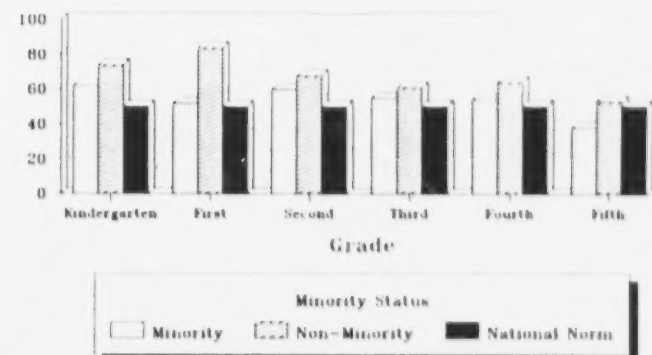
Note: Percentile Ranks based on mean grade equivalent scores

Figure 5a
ITBS Math Achievement by Grade and by
Minority Status: Gladstone, 1990-1991



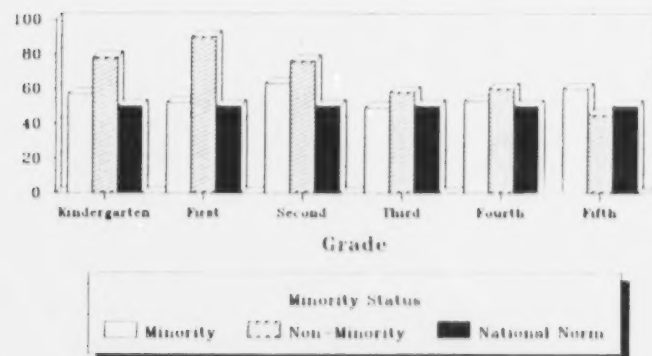
Note: Percentile ranks based on mean grade equivalent scores

Figure 5b
ITBS Math Achievement by Grade and by
Minority Status: Three Trails, 1990-1991



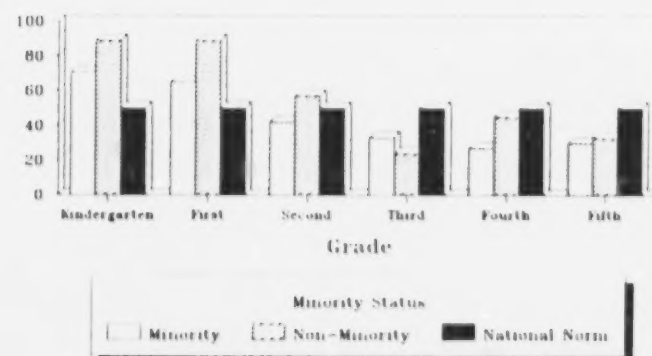
Note: Percentile ranks based on mean grade equivalent scores

Figure 5c
ITBS Math Achievement by Grade and by
Minority Status: Weeks, 1990-1991



Note: Percentile ranks based on mean grade equivalent scores

Figure 5d
ITBS Math Achievement by Grade and by
Minority Status: Wheatley, 1990-1991



Note: Percentile ranks based on mean grade equivalent scores

through grade four; Weeks in all grades except third grade; and Wheatley in kindergarten and first grade.

Science achievement. When science achievement was examined, for all grades tested, the math/science elementary schools were close to, or above the national norm (see Table 11 and Figure 6). When examined by minority status of students, non-minority students were at or above the national norm at all grade levels and schools with the exception of Wheatley grades three and four (see Figures 7a through 7d). Similarly, minority students were at or above the national norm at all grade levels at Gladstone, Three Trails, and Weeks. Wheatley minority students were above the national norm at the first and third grades.

Reading achievement. Reading achievement was typically found to be poorer than that found for science and math (see Table 11). In the first and fifth grades, Gladstone students perform above the national norm. Three Trails students were above the national norm in second through fifth grade. Alternately, Weeks and Wheatley students were below the national norm in each of the grade levels tested.

When reading achievement was examined by ethnic group, Gladstone non-minority students were above the national norm in first, second, fourth and fifth grades. Three Trails non-minority students, at each grade level, were above the national norm. Weeks non-minority students were above the national norm only at grade two. Wheatley non-minority students exceeded the national norm at the first grade level. Conversely, Gladstone's first grade minority students were the only minority group, across the four schools, to have exceeded the national norm in reading achievement.

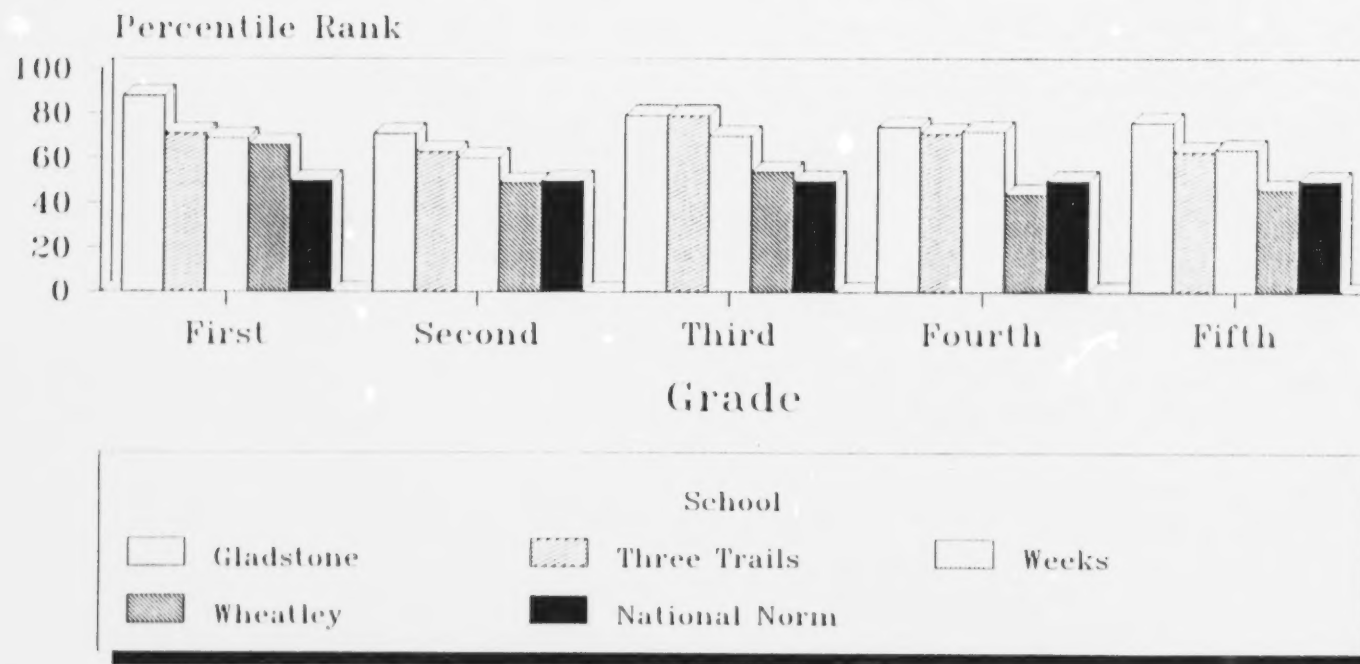
Language achievement. At each grade level, Gladstone and Three Trails students exceeded the national norm (see Table 11). Similarly, Weeks students exceeded the national norm at all grade levels, with the exception of grade five. At Wheatley, students in kindergarten, first and second grades were above the national norm.

When ethnic group performance was examined, Gladstone and Three Trails non-minority students exceeded the national norm at each grade level. Weeks students were above the national norm at the kindergarten, second, third, and fourth grades. Wheatley non-minority students exceeded the norm in kindergarten and first grade.

Minority students at Gladstone exceeded the national norm in kindergarten, first, and third grades. Three Trails minority students were above the norm in each grade, with the exception of first grade. All Weeks grade levels exceeded the national norm, except for the fifth grade.

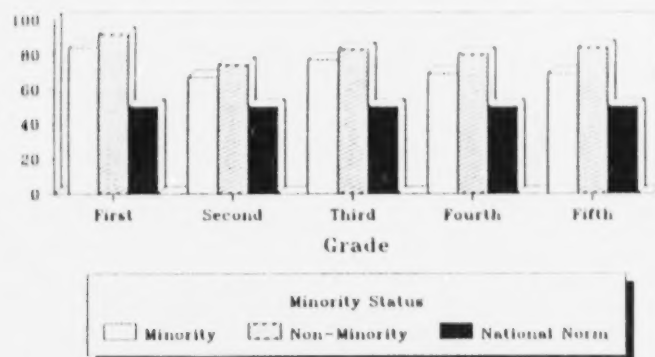
Figure 6

ITBS Science Achievement by School and by Grade, 1990-1991



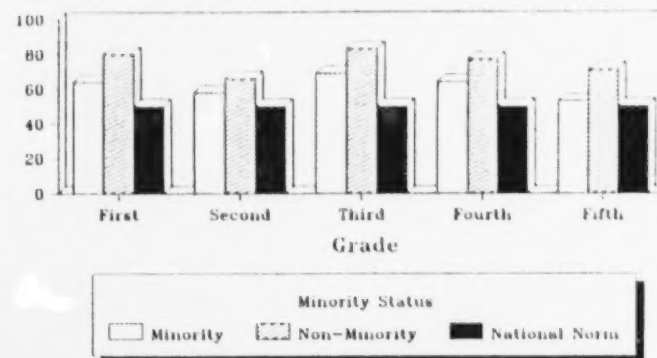
Note: Percentile Ranks based on mean grade equivalent scores.

Figure 7a
ITBS Science Achievement by Grade and by
Minority Status: Gladstone, 1990-1991



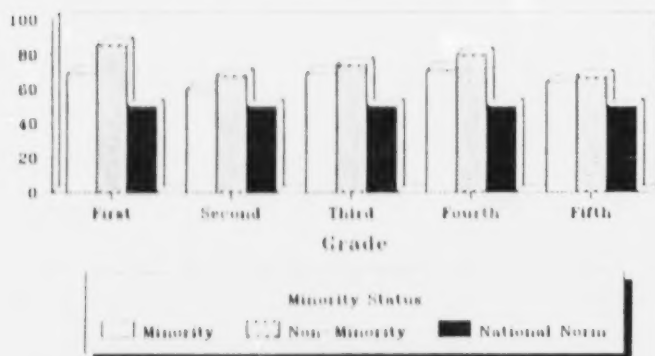
Note: Percentile ranks based on mean grade equivalent scores

Figure 7b
ITBS Science Achievement by Grade and by
Minority Status: Three Trails, 1990-1991



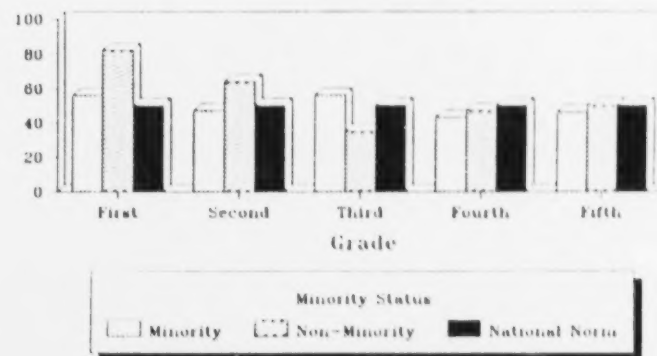
Note: Percentile ranks based on mean grade equivalent scores

Figure 7c
ITBS Science Achievement by Grade and by
Minority Status: Weeks, 1990-1991



Note: Percentile ranks based on mean grade equivalent scores

Figure 7d
ITBS Science Achievement by Grade and by
Minority Status: Wheatley, 1990-1991



Note: Percentile ranks based on mean grade equivalent scores

Wheatley's minority students in kindergarten, first, and second grades were above the national norm.

In summarizing the performance of the elementary magnets, it can be said that, in general, math and science achievement is typically better than reading and language achievement. Further, non-minority students are scoring higher than minority students. Additionally, Gladstone, Three Trails, and Weeks students typically score higher than do students at Wheatley.

MMAT. MMAT achievement scores indicate that, while the state average has declined from the prior year, district scores have increased in the four areas tested. MMAT achievement growth across the four schools was mixed (see Table 12). Three of the four schools had gains from the prior year in science; 2 of 4 schools had gains in math, reading, and social studies. Each of the schools, across the four content areas, had average scale scores below the state average. Only Gladstone had scores, in each of the content areas, above the district norm. Three Trails was above district norm in science, reading, and social studies. Weeks and Wheatley had scores below district norms.

DRP. Table 13 displays the Degrees of Reading Power mean unit scores and percentile ranks for the 1990 and 1991 test administration for fifth graders at the math/science elementary schools. In the DRP tests, the DRP units form a scale of prose difficulty or readability. DRP units reported are at the instructional level. DRP test scores are interpreted as norm-refer-

Table 12
Science/Math Elementary Magnet Program
Missouri Mastery and Achievement Test Scale Scores: Grade 3
Spring 1989, 1990, 1991

School	Science			Math			Reading/ Language Arts			Social Studies/ Civics		
	1989	1990	1991	1989	1990	1991	1989	1990	1991	1989	1990	1991
Gladstone	317	307	308	271	298	309	323	297	283	318	304	305
Three Trails	301	330	316	289	298	283	280	284	287	289	320	300
Weeks	252	261	263	261	288	278	263	246	253	262	264	252
Wheatley	241	258	282	246	250	268	239	255	254	240	270	278
District Average	282	278	290	275	278	289	275	267	274	284	282	286
State Average	344	347	344	323	330	326	328	323	321	337	346	336

Note: Scores from 1989 have been revised to correct for errors in the State's scoring program.

enced scores. At such, the percentile ranks reported indicate what percent of the national norm sample scored at or below the math/science schools.

It can be seen in Table 13 that Gladstone and Three Trails students are scoring above the national norm (50) and Weeks and Wheatley students are below the national norm for the reading skills assessed by the DRP. Furthermore, percentile ranks have declined since 1990 for each of the four schools.

Summary and Recommendations

The elementary science and mathematics magnet schools have completed their second year of operation as part of the Kansas City, Missouri, School District's *Long-Range Magnet School Plan*. The elementary science/math program is being implemented at Gladstone, Three Trails, Weeks, and Wheatley.

This formative evaluation report has documented the progress made by four schools during their second year of implementing the science/math theme. The evaluation was guided by the goals and objectives established at each school and in the *Long-Range Magnet School Plan*. The results of this evaluation indicate that three of the four elementary science/math magnets had a total school enrollment seven to nine percent below program capacity. Furthermore, all grade levels, with the exception of Wheatley kindergarten, had actual student enrollments slightly less than the stated capacity for the grade.

The elementary math/science schools are making progress in their efforts to meet the desegregative goals of the district. Two schools, Gladstone and Three Trails, are closer to meeting racial composition guidelines. Alternately, Weeks and Wheatley are still far from meeting the court-ordered desegregative guidelines. However, Wheatley has demonstrated

Table 13
Degrees of Reading Power
Science/Math Elementary Magnet Program
1990, 1991

School	DRP Units		Percentile	
	1990	1991	1990	1991
Gladstone	55	53	66	52
Three Trails	54	54	63	55
Weeks	48	46	47	31
Wheatley	46	46	41	31

considerable progress toward the 60% minority/40% non-minority expectancy by increasing non-minority enrollment 7% from the first year of implementation. Class size enrollment figures indicated that, across most grade levels, each school has maintained the court-mandated pupil-to-teacher ratio.

Almost 3,000 minutes of observational data suggested that deductive learning (inquiry, and problem-solving) skills are being promoted in almost half of the observation intervals. Similarly, visits to laboratory and classrooms indicated that hands-on learning opportunities are frequent in computer, math, and science settings.

Program participants report favorable perceptions of the magnet program. Teacher responses indicate progress in the implementation of the magnet theme. One area of concern for teachers at Weeks and Wheatley was safety. Less than half the teachers at these schools felt safe in their teaching environment. Alternately, more than 80% of the teachers at Gladstone and Three Trails felt safe.

Student and parent perceptions of the science/math program appear quite favorable. A large majority of students are glad they go to their school and feel good about their school. Parents report favorable perceptions and feel well informed about the program. Parents report satisfaction with their child's progress in science, math, and other basic skills. Greater than 90% of the parents would recommend their child's school to other parents.

Achievement performance of students at the four schools was found to be quite diverse. Science and math ITBS achievement is above or near the national norm in each of five grade levels tested. Reading achievement is generally below the national norm and has not improved significantly since the first year of program implementation. Alternately, language ITBS scores are generally better than reading scores and improvements since program implementation have been variable across schools and grades. Achievement scores examined by ethnic group indicated that non-minority students are typically scoring above the national norm. Minority students are above the national norm at many grade levels and content areas. However, non-minority students are typically outscoring their minority peers. DRP results indicated that fifth graders at Gladstone and Three Trails are above the national norm. Weeks and Wheatley students were below the norm. Further, DRP scores have declined since the first year of implementation.

1. Continue efforts to bring the racial composition of the four new math/science elementary schools into line with court-ordered desegregation goals. Improvements in the racial composition of students at Three Trails and Wheatley were found for the current year. While Weeks had a 2% increase in non-minority enrollment, the school is still at more than 90% minority enrollment.
2. Increase opportunities for students to visit science and animal rooms. Approximately one-quarter of the observation visits found no students in either of these labs. Alternately, the computer and math labs were vacant during less than 15% of the visits. While the incidence of unoccupied labs has significantly improved since the first year of implementation, it is expected that labs should be occupied more than 75% of the time.
3. Almost 3,000 observation intervals indicated that computer classes were not engaging in deductive, inquiry-oriented learning to an extent found in other learning settings. While computer classes were found to be providing substantial opportunities for problem-solving, the opportunity for students to explore and examine was not as evident. Inquiry can be characterized by the following question: "what do you think might cause . . . ?", or creating a situation where the student is prompted to ask questions or dig deeper into a topic.
4. Increase opportunities for problem-solving during math/science instruction. Observations in classrooms indicated that non-theme, as well as theme, instruction did not evidence substantial exposure to problem-solving techniques. While inquiry opportunities were quite evident in classrooms (excepting computer classrooms), problem-solving, a logical extension to inquiry, was not as evident. In particular, only 17% of the observation intervals had evidence of problem-solving during math/science instruction.
5. District leadership should explore concerns of physical safety with teachers and staff at Weeks and Wheatley. One area of concern for teachers at Weeks and Wheatley was safety. Less than half the teachers at these schools felt safe in their teaching environment. Alternately, more than 80% of the teachers at Gladstone and Three Trails felt safe.
6. District and school leadership should re-examine the program of reading instruction at the math/science schools. ITBS and DRP achievement scores indicated that instruction is not having an appreciable impact upon reading skills of program students. With the exception of Gladstone first grade students, and in some instances non-minority students at particular grade levels, ITBS reading achievement scores are substantially lower than are scores in other content areas tested. Furthermore, minority student reading performance is below the national norm at all grade levels tested. When a grade level was found to be above the national norm it could be attributed to higher non-minority scores.

References

- Hale, P.D. & Levine, D.U. (1986). *Long-Range Magnet School Plan*. Kansas City, MO: Kansas City, Missouri School District.
- Moore, W.F. (1990). *Mid-Year Formative Evaluation of the First Year Science and Mathematics Elementary Magnet Schools, 1989-1990*. Kansas City, MO: Kansas City, Missouri School District.
- Gladstone Elementary School Science/Math Magnet Site Task Force. (1989). *Gladstone Magnet School Planning*. Kansas City, MO: Kansas City, Missouri, School District.
- Research Office. (1990). *September 26, 1990, Student Membership*. Kansas City, MO: Kansas City, Missouri School District.
- Research Office. (1989). *September 27, 1989, Student Membership*. Kansas City, MO: Kansas City, Missouri, School District.
- Three Trails Elementary School Science/Math Magnet Site Task Force. (1989). *Three Trails School Science/Math Magnet Planning Outline*. Kansas City, MO: Kansas City, Missouri, School District.
- Weeks Elementary School Science/Mathematics Magnet Site Task Force. (1989). *Weeks School Science/Mathematics Magnet Planning*. Kansas City, MO: Kansas City, Missouri, School District.
- Wheatley Elementary School Science/Math Magnet Site Task Force. *Phillis Wheatley School Science/Math Magnet Plan*. Kansas City, MO: Kansas City, Missouri, School District.

Acknowledgements

The author would like to acknowledge the assistance of clerical assistant, Lois Wilkins and part-time data collectors, Martin Chislom Jr. and Karl Welch. The scope of this evaluation would not have been possible without their clerical expertise, data collection, and data entry assistance.

Appendix A
Field Trips, Guest Speakers,
Contents/Awards

APPENDIX A

Field Trips

Burr Oak Woods Nature Center
Kansas City Museum
Planetarium at Southwest High School
Cave Spring Interpretive Center
Kansas City Zoo
Worlds of Fun
Shawnee Mission Environmental Science Lab
Kansas City Water Works
Knob Noster State Park
Kaleidoscope
Farmstead Farms, Deanna Ruse
Kansas City Children's Museum
Sibley Apple Orchard
Nelson Art Gallery
Pumpkin Patch (Caldwell Farms)
Town Pavilion, Estimations
Lake Jacomo
Powell Gardens
Missouri Town
American Royal
Exchange City
Kansas University Museum of History & Science
Bowling & Fairmount Park
Stable T. Farms
Kansas City Lawn & Garden Show
Loose Park
K.C. Fire Stations

Guest Speakers/Assembly

Denny Olson "Critterman"
Slim Goodbody-Musical Health Show
Scott Campbell-Nature Series
Dental Health Program
K.C. Zoo Docents Program
Woodsy Owl Program
Dog Safety Program
Program by Animal Control
Beekeeping Program
Program on Lambs and Sheep

Diane Hardiman "Animal Technician"
Dr. Lou Marshall-NASA
Gene Kelly "Science Careers"
Mrs. Ludlow's Traveling Scientists
Program by KPL Gas Service
Aerie National Series Program
Beef Council Ambassador Program
L.C. Collier-(Physical SC, Anti Drugs) Program

Contests/Awards

S.T.E.P.S. Math Bee
K.C. math Bee
Math-A-Thon
K.C. Science Fair
National Chemistry Contest
National Science Olympiad
MCTM Math-Computer & Art Poster Contest
MCTM Regional Math Contest

Awards

1. KC Science Fair
4 - 1st Place
19- 2nd Place
11- 3rd Place
2. MCTM Math/Computer-Art Poster Contest
1 - 2nd Place
1 - 3rd Place
3. MCTM Regional Math Contest
1 - 1st Place
1 - 2nd Place
1 - 3rd Place
4 - Recognitions
4. Steps Math Bee

Appendix B
Perceptions by School

Table B-1
Science / Math Elementary Magnet Program
Teacher Perceptions By School, 1991

Statement	Gladstone (N= 17)		Three Trails (N= 24)		Weeks (N= 37)		Wheatley (N= 24)	
	Agree	Disagree	Agree	Disagree	Agree	Disagree	Agree	Disagree
1. Science and mathematics theme is clear.	94%	6%	100%	0%	100%	0%	100%	0%
2. Informed about magnet school plan.	94%	6%	100%	0%	97%	3%	96%	4%
3. Believe school is implementing magnet theme.	94%	6%	100%	0%	100%	0%	88%	13%
4. Building magnet theme support staff provided needed support to implement magnet theme.	100%	0%	100%	0%	95%	5%	86%	14%
5. Building level administrative staff provided support needed to implement magnet theme.	100%	0%	100%	0%	75%	25%	65%	35%
6. Able to infuse magnet curriculum into basic curricula of district.	100%	0%	100%	0%	100%	0%	100%	0%
7. Satisfied with quality of instructional leadership received.	100%	0%	96%	4%	63%	37%	57%	43%
8. Satisfied with quantity of instructional leadership received.	94%	6%	96%	4%	68%	32%	48%	52%
9. I feel professionally challenged teaching in the science/math program.	100%	0%	96%	4%	97%	3%	87%	13%
10. Satisfied with assistance received from animal resource teacher. ¹	---	---	100%	0%	83%	17%	86%	14%
11. Satisfied with assistance received from computer resource teacher. ¹	88%	12%	100%	0%	84%	16%	90%	10%
12. Satisfied with assistance received from math resource teacher. ¹	94%	6%	100%	0%	73%	27%	90%	10%
13. Satisfied with assistance received from science resource teacher. ¹	100%	0%	85%	15%	97%	3%	95%	5%
14. Given information and instruction needed to operate computer(s) in classroom. ²	100%	0%	89%	11%	79%	21%	63%	37%
15. Given information and instruction needed to use computer software. ²	100%	0%	95%	5%	79%	21%	65%	35%

Table B-1 (continued)
Science / Math Elementary Magnet Program
Teacher Perceptions By School, 1991

Statement	Gladstone (N= 17)		Three Trails (N= 24)		Weeks (N= 37)		Wheatley (N= 24)	
	Agree	Disagree	Agree	Disagree	Agree	Disagree	Agree	Disagree
16. Able to apply staff development offered during the summer and the school year.	100%	0%	100%	0%	91%	9%	70%	30%
17. Satisfied with in-service regarding science/math infusion.	100%	0%	100%	0%	88%	12%	52%	48%
18. Able to get materials needed to implement the science/math magnet theme.	100%	0%	100%	0%	94%	6%	65%	35%
19. Have access to math manipulatives.	100%	0%	100%	0%	97%	3%	86%	14%
20. Overall, what rating would you give to this magnet school program this year?								
Excellent		77%		92%		32%		13%
Good		24%		0%		35%		29%
Average		0%		0%		14%		33%
Fair		0%		8%		16%		21%
Poor		0%		0%		3%		4%

Note: Percentages are rounded to nearest whole percent.

¹ Only classroom teachers were asked to respond to this item.

² Only teachers with computers in their room were asked to respond to this item.

Table B-2
Science/Math Elementary Magnet Program
Student Perceptions by School, 1991

Item Content	Gladstone (N=110)		Three Trails (N= 135)		Weeks (N=144)		Wheatley (N=146)	
	Agree	Disagree	Agree	Disagree	Agree	Disagree	Agree	Disagree
1. I am glad I go to _____.	95%	5%	90%	10%	80%	20%	68%	32%
2. I am learning a lot on the computers at _____.	93%	7%	88%	12%	83%	17%	77%	23%
3. I have learned about different kinds of animals this year. ¹	---	---	94%	50%	94%	6%	77%	23%
4. I am learning a lot about math this year.	92%	8%	95%	5%	94%	6%	92%	8%
5. I am learning a lot about science this year.	95%	5%	87%	13%	93%	7%	86%	14%
6. I have enjoyed my field trips this year.	87%	13%	93%	7%	80%	20%	81%	19%
7. I enjoy going to the computer room.	95%	5%	97%	3%	87%	13%	81%	19%
8. I enjoy having math teacher come to my room (or going to math lab).	82%	18%	90%	10%	75%	25%	70%	30%
9. I enjoy going to the science room.	94%	6%	76%	24%	85%	15%	90%	10%
10. I have learned to do math problems on the computer this year. ¹	93%	7%	98%	2%	94%	6%	87%	13%
11. I have gotten to solve interesting math problems when math teacher comes to my room.	85%	15%	84%	16%	76%	24%	70%	30%
12. I have gotten to do interesting science projects and experiments in the science room this year.	93%	7%	85%	15%	94%	6%	88%	12%
13. Math room lessons have helped me learn more about math this year.	83%	17%	82%	18%	87%	13%	73%	17%
14. Lessons in science room have helped me learn more about science this year.	92%	8%	82%	18%	88%	12%	87%	13%
15. I like doing math problems.	76%	24%	76%	24%	80%	20%	69%	31%
16. I like doing science projects and experiments.	95%	5%	87%	23%	91%	9%	82%	18%
17. I like math.	79%	21%	84%	16%	75%	25%	71%	29%
18. I like science.	91%	9%	77%	23%	81%	19%	84%	16%

Table B-2 (continued)
Science/Math Elementary Magnet Program
Student Perceptions by School, 1991

Item Content	Gladstone (N=110)		Three Trails (N=135)		Weeks (N=144)		Wheatley (N=146)	
	Agree	Disagree	Agree	Disagree	Agree	Disagree	Agree	Disagree
19. I feel good about my school.	92%	8%	82%	18%	69%	31%	63%	37%
20. I have interesting things to do in the before-school program. ²	83%	17%	89%	11%	81%	19%	54%	46%
21. I have interesting things to do in the after-school program. ²	89%	11%	94%	6%	92%	8%	86%	14%
22. Gotten to be in a Science Fair this year. ⁴	68%	32%	91%	9%	91%	9%	54%	46%
23. Enjoy doing math problems on the computer. ⁴	89%	11%	63%	37%	73%	27%	78%	22%
24. I have a chance to try things out and see what works best. ⁴	89%	11%	80%	20%	77%	23%	65%	35%
25. I would like to have a job when I grow up that lets me do science projects. ⁴	38%	62%	24%	76%	26%	74%	31%	69%
26. I would like to have a job when I grow up that lets me work with math. ⁴	68%	32%	49%	51%	52%	49%	48%	52%
27. I would like to have a job when I grow up that lets me use computers. ⁴	79%	21%	71%	29%	77%	23%	73%	28%
28. I would like to have a job when I grow up that lets me care for animals. ⁴	61%	39%	58%	42%	39%	62%	29%	71%

Note: Percentages are rounded to the nearest whole percent.

1 Gladstone does not have animal resources.

2 Only Extended Day participants responded to this item.

3 Only 1st, 2nd, and 3rd grades.

4 Only 4th, 5th, and 6th grades.

Table B-3
Parent Perceptions by School
Science/Math Elementary Magnet Program
1991

Item Content	Gladstone (N = 75)		Three Trails (N = 78)		Weeks (N = 80)		Wheatley (N = 73)	
	Agree	Disagree	Agree	Disagree	Agree	Disagree	Agree	Disagree
1. Satisfied with program.	89%	11%	95%	5%	86%	14%	91%	9%
2. Science/math theme is clear.	87%	13%	99%	1%	94%	6%	79%	21%
3. Know how students selected for magnet schools.	31%	69%	40%	60%	21%	79%	23%	77%
4. Magnet selection process is fair. ¹	55%	45%	77%	23%	47%	53%	46%	54%
5. Magnet application handled in a reasonable time.	83%	17%	88%	12%	94%	6%	86%	14%
6. Child applied to be at _____.	96%	4%	44%	56%	53%	48%	60%	40%
7. Attended last parent/teacher conference.	57%	43%	69%	31%	65%	35%	60%	40%
8. Satisfied with computer use/activities.	87%	13%	96%	4%	95%	5%	93%	7%
9. Satisfied with child's progress in math.	89%	11%	89%	12%	90%	10%	87%	13%
10. Satisfied with child's progress in science.	89%	11%	89%	12%	89%	11%	87%	13%
11. Satisfied with child's progress in other basic skills.	89%	11%	92%	8%	90%	10%	85%	15%
12. Child attends extended day.	44%	56%	33%	67%	46%	54%	26%	74%
13. Extended day one reason for enrolling child at _____.	7%	93%	58%	42%	67%	33%	21%	79%
14. Satisfied with extended day activities. ²	90%	10%	92%	8%	95%	5%	94%	6%
15. Extended day provides proper supervision. ²	92%	8%	92%	8%	92%	8%	100%	0%
16. Child uses district transportation.	64%	36%	86%	14%	65%	35%	56%	44%
17. Child's transportation is timely. ³	89%	11%	90%	10%	85%	15%	89%	11%
18. Child's transportation is safe. ³	93%	7%	97%	3%	94%	6%	95%	5%
19. Principal is responsive to my concerns.	88%	12%	97%	3%	90%	10%	95%	5%
20. Parent participation is welcome at _____.	92%	8%	99%	1%	97%	3%	97%	3%
21. Would recommend school to other parents.	88%	12%	96%	4%	85%	15%	94%	6%

Note: Percentages are rounded to the nearest whole percent.

¹Of those who know how students are selected (N= 87).

²Of those whose children attend extended day (N= 113).

³Of those whose children use district transportation (N= 209).

BEST COPY AVAILABLE

Table B-4
Additional Parent Perceptions
Science/Math Elementary Magnet Program
1991

"How would you rate ..."	Below				
	Excellent	Good	Average	Average	Poor
	(Rating of those who had an opinion)				
Overall school program	37%	46%	15%	1%	1%
Condition of building	65%	29%	5%	0%	1%
Administration in your child's school	44%	37%	15%	3%	1%
Teachers in your child's school	55%	32%	11%	1%	2%
Quality of math/science education	48%	37%	9%	6%	0%
Parent opportunity to be involved	58%	32%	7%	1%	2%
School communication with parent	45%	35%	12%	5%	2%
Extended Day Program	50%	37%	11%	1%	2%

Note: Percentages are rounded to the nearest whole percent.

BEST COPY AVAILABLE

Table B-5
Reasons Parents Chose
Science/Math Elementary Magnets
1990-1991

Reasons	N	% ¹
Child attended last year	178	58%
Neighborhood school	144	47%
Parents liked the theme	204	67%
Other children in family attended the school	110	36%
Other reasons	79	26%

Note. Percentages are rounded to the nearest whole percent.
¹ Many respondents indicated more than one reason.

Table B-6
Ways Parents Learned About
Science/Math Elementary Magnets
1990-1991

Source	N	% ¹
Friends, co-workers	65	21%
Newspaper articles, ads	20	7%
Parent organizations (e.g., PTA)	39	13%
Radio	12	4%
School brochures	108	35%
School employees	118	39%
Students	95	31%
Television	14	5%

Note: Percentages are rounded to the nearest whole percent.

¹ Many respondents indicated more than one source.

Appendix C
Extended Day Classes

APPENDIX C

Extended Day (Activities/Clubs) Classes

Math Club	Tutorial/Homework
Computer Club	Class
Science Adventures	Dance
Young Astronauts	Sports/Physical
Animal Care-/Studies	Education
Chess Club	Keyboards
Green Thumbs Club (In-	Creative Writing
door Gardens	Reading Enrichment
Humming Birds (School	Thinking Skills
Choir)	Signing
Rope Jumping Teams	Culinary Arts
Economics Club	Arts & Crafts
Strategy and Art	

The School District of Kansas City, Missouri